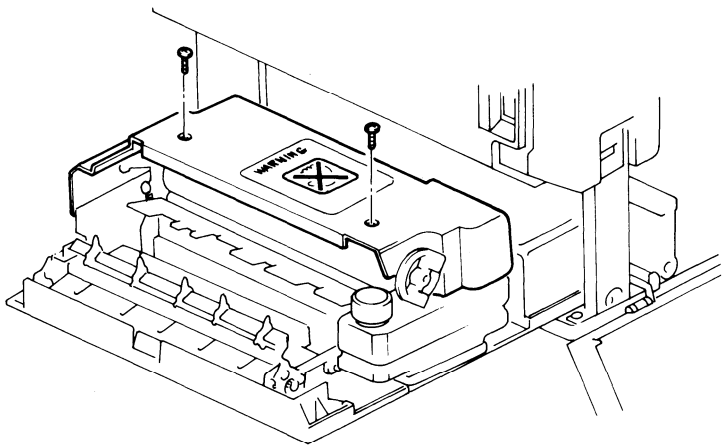
CAUTIONS

1. **KEEP HANDS AWAY FROM MECHANICAL DRIVE COMPONENTS WHEN THE COPIER IS WARMING UP.**

   This is to avoid possible injury when the copier starts idling at the end of warm up.

2. **ALWAYS REINSTALL THE FUSING UNIT COVER AFTER SERVICING.**

   This is to prevent the operator from accidentally touching the hot unit, or the fusing lamp terminal.



RICOH FT3020/FT3050/FT3060

FIELD SERVICE MANUAL

RICOH COMPANY, LTD.

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SECTION 1

INSTALLATION REQUIREMENTS

1. INSTALLATION REQUIREMENTS

1A. Environment 1-1

1B. Machine Level 1-2

1C. Minimum Space Requirements 1-3

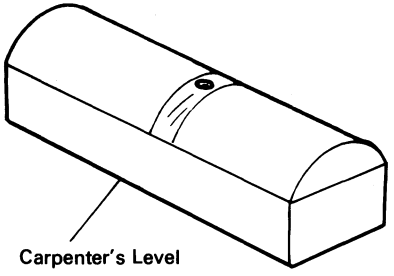
1D. Power Source 1-4

1A. Environment

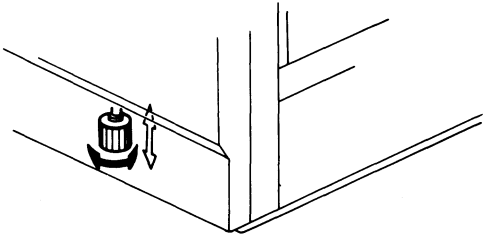
1. Temperature Range : 10°C to 30°C (50°F to 86°F)
2. Humidity Range : 15% to 90% RH
3. Ambient Illumination : Less than 1,500 luxs (Do not expose to direct sunlight)
4. Ventilation : Room air should turn over at least 3 times/hour.
5. Ambient Dust : Less than 0.15 mg/m^3 (4×100^{-3} Oz/yd^3)
6. Room Size : More than $10m^3$ ($13.4\ yd^3$)
7. If the installation place is air-conditioned or heated, place the machine:
   a. Where it will not be subjected to sudden temperature changes from low to high, or vice versa.
   b. Where it will not be directly exposed to cool air from an air conditioner in the summer.
   c. Where it will not be directly exposed to reflected heat from a space heater in winter.
8. Avoid placing the copier in an area filled with corrosive gas.
9. Avoid any area higher than 2,000m (6,500 feet) above sea level.
10. Place the copier on a strong and level base.
11. Avoid any area where the copier may be subjected to frequent strong vibration.

1B. Machine Level

1. Front to Back:
   Within 5mm (0.2”) of level

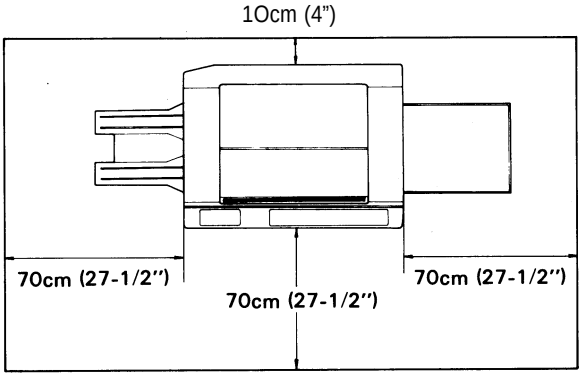


2. Right to Left:
   Within 5 mm (0.2”) of level
   (Legs may be screwed up or down to level the machine. Set a carpenter’s level on the exposure glass.)



1C. Minimum Space Requirements

1. Front : 70 cm (27-1/2")
2. Back : 10 cm (4")
3. Right : 70 cm (27-1/2")
4. Left : 70 cm (27-1/2")



1 D. Power Source

1. Input Voltage Level
   110V/60Hz : More than 12A
   115V/60Hz : More than 12A
   220V/50Hz : More than 7A
   240V/50Hz : More than 7A

2. Permissible Voltage Fluctuation : ± 10%

3. Permissible Extension Cord:
   At least 300V, 30A capacity and less than 5 m (16.4") long.

NOTE: 1. Be sure to ground the machine. (Do not connect the grounding wire to a gas pipe.)

2. Make sure the plug is firmly inserted in the outlet.

3. Avoid multi-wiring.

4. Do not set anything on the power cord.

SECTION 2

UNPACKING

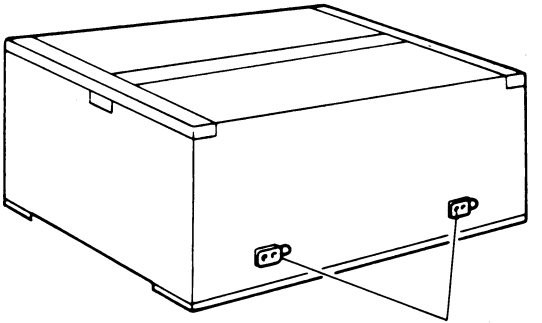
2. UNPACKING

2A. Unpacking Procedure 2-1

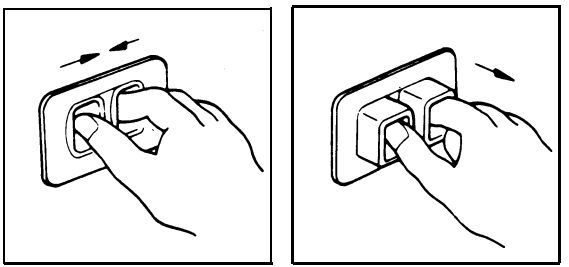
2B. Accessary Check 2-4

2A. Unpacking Procedure

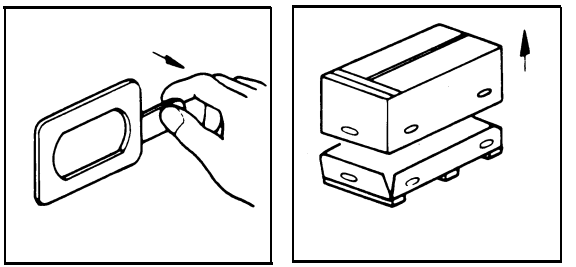
1. Remove the 4 box joiners and the top box. (See illustrations)
2. Take out the accessories.
3. Remove the cushion blocks.
4. Open the vinyl bag.
5. Take out the machine.



Joiners

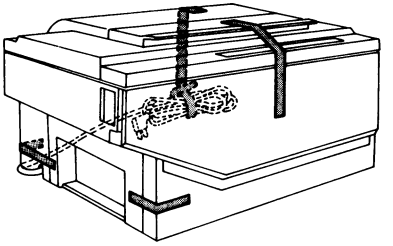


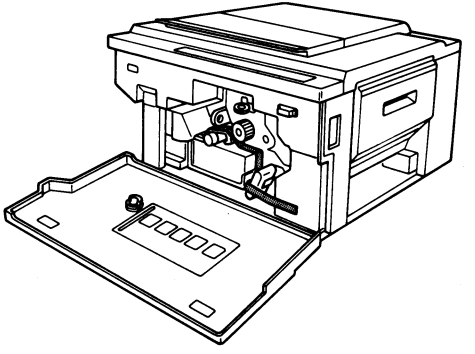
Squeeze and pull out the inner portion of the Box Joiner.



Pull out the outer portion of the Box Jointer and take off the Top Box.

6. Remove the six strips of tape shown in the illustrations to the right.





7. Grasp the slide unit handle, rotate it counterclockwise, and push it to the left.

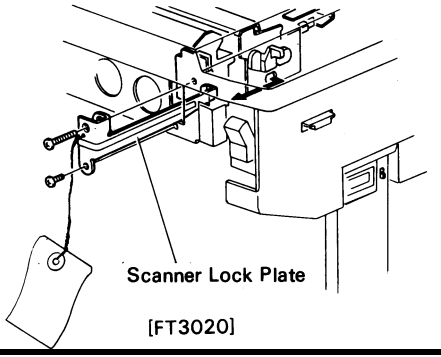
8. Remove the wedge from the lower registration roller bushing while pushing down the lower registration roller as shown.

9. Remove the left cover (3 screws).

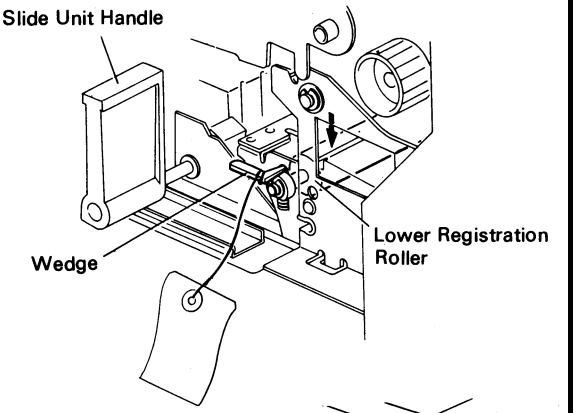
10. Remove the scanner lock plate (2 screws [FT3020]/1 screw [FT3050/FT3060]).

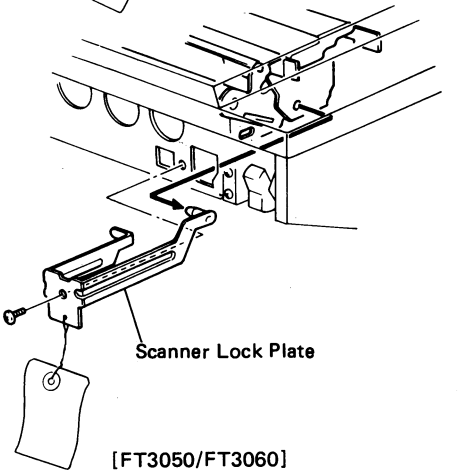
NOTE: Do not throw away the scanner lock plate. It is necessary to reinstall it if the copier is transported to a new location.

11. Reinstall the left cover.



[FT3020]





[FT3050/FT3060]

2B. Accessary Check

Check quantity and condition of the accessories in the box according to the New Equipment Condition Report or the following list.

1. Universal Cassette 1
2. Cassette Magnets . . . . . 2 extra
3. Cassette Decals 1
4. Copy Tray 1
5. Original Holder (FT3060) only 1
6. Selenium Drum 1
7. Operating Instructions 1
8. Operating Instruction Holder 1
9. Installation Procedure 1
10. N.E.C.R 1
11. Envelope for N.E.C.R. (115V only) 1
12. Multi-lingual Decal (220/240V only) . . . . . 2 large, 1 small [FT3020]
    2 large, 2 small [FT3050/FT3060]

SECTION 3

INSTALLATION

3. INSTALLATION

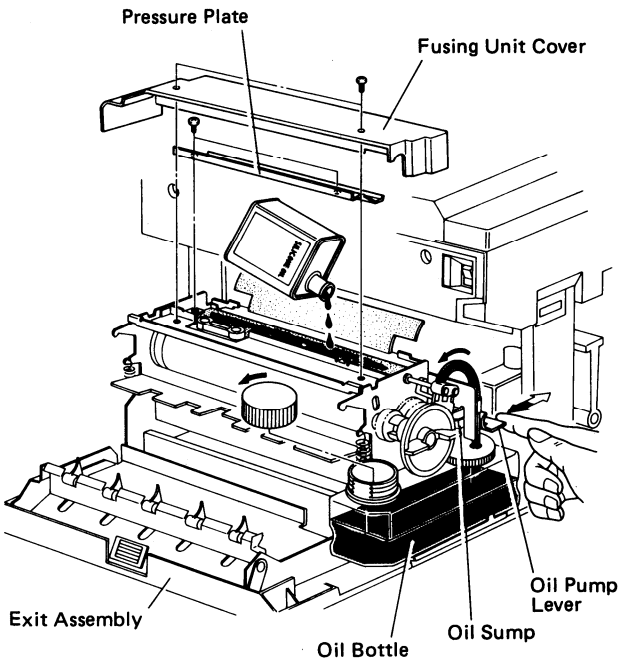
3A. Installation 3-1

3B. Cassette Modification 3-7

3C. Key Counter Holder Installation 3-8

3A. Installation

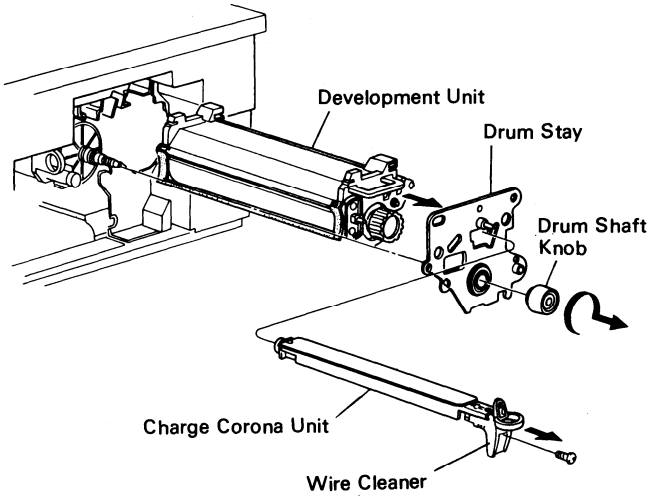
1. Check the machine level (within 5 mm (0.2")).
2. Open the front cover and push the slide unit to the left.
3. Open the exit assembly and fill the oil bottle with silicone oil.
4. Remove the fusing unit cover (2 screws) and the pressure plate (2 non-tapping screws).
5. Prime the oil supply system.
6. Pump up silicone oil by pushing the oil pump lever manually and confirm that silicone oil drops into the oil sump.
7. Reassemble the fusing unit.



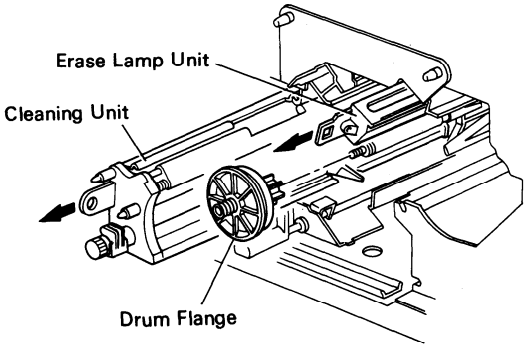
8. Remove the charge corona unit together with the wire cleaner (1 screw).

9. Turn the drum shaft knob CLOCKWISE and take off the drum stay.

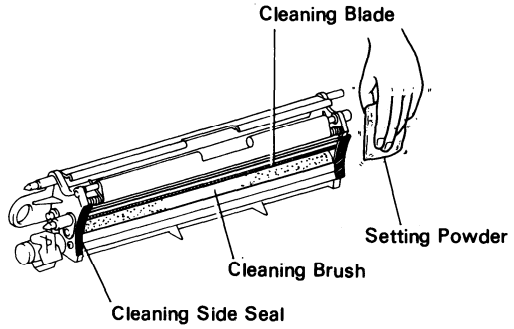
10. Take out the development unit and place it on a sheet of paper.



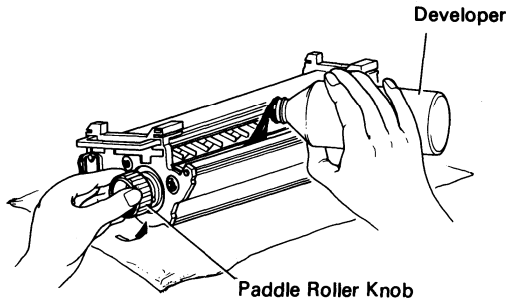
11. Take out the cleaning unit, the erase lamp unit, and the drum flange.



12. Dust the drum, the cleaning blade, the cleaning brush, and the cleaning side seals with setting powder.

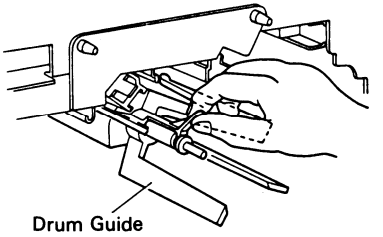


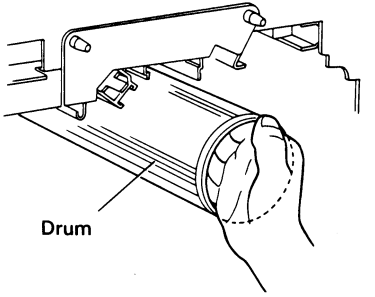
13. Pour one bottle of developer (1 kg RICOH TYPE 4000) into the development unit.
Turn the paddle roller knob counterclockwise to smooth the developer while pouring it in.



14. Pull out the drum guide and insert the drum.

15. Set the drum flange.





16. Insert the development unit, the cleaning unit, and the erase lamp unit.

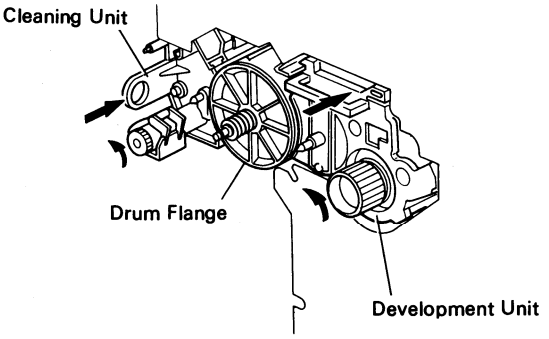
NOTE: When the development unit and the cleaning unit are well set, their front surfaces are flush with the drum flange.
Turn the knobs of the development and cleaning units counterclockwise to engage gears.

17. Set the drum stay and the charge corona unit with wire cleaner.

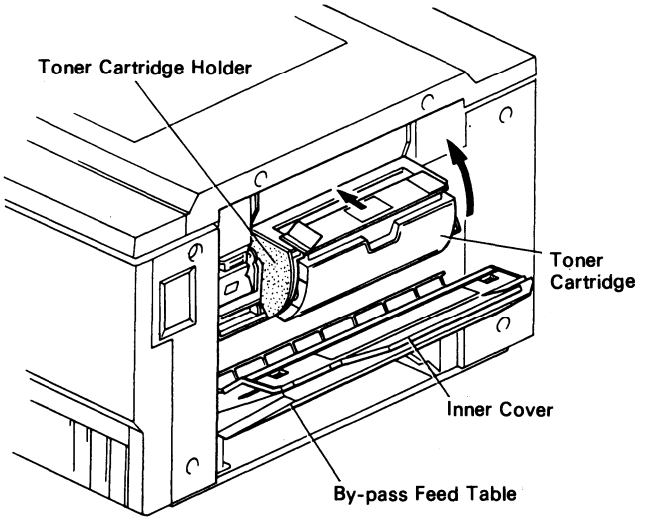
18. Close the exit assembly and reset the slide unit.

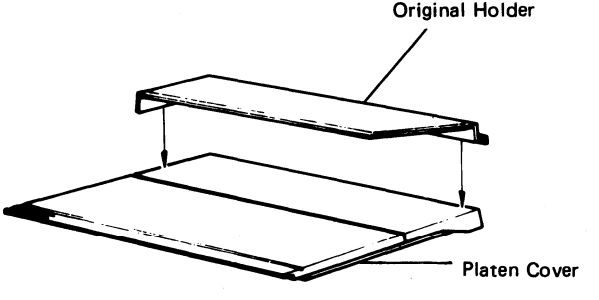
CAUTION: *To prevent the drum from being damaged, do not set the slide unit without first setting the drum stay.
*To set the slide unit firmly, push the slide unit handle to the right.

19. Close the front cover.



20. Open the by-pass feed table and the black inner cover.
21. Turn down the toner cartridge holder and set a toner cartridge.
22. Reset the toner cartridge holder, the inner cover, and the by-pass feed table.
23. Install the original holder [FT3060].
24. Load paper in the cassette; then, set the cassette and the copy tray.
25. Turn on the main switch, and check the machine operation and the copy quality.
26. Fill out the New Equipment Condition Report.





3B. Cassette Modification

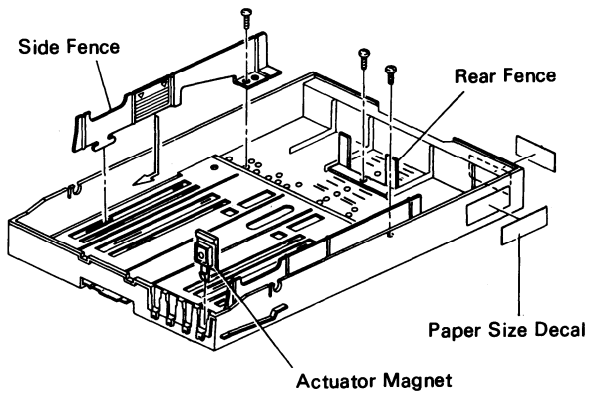
1. Take off the cassette cover.
2. Move the side fences and the rear fence to the desired paper size position (1 screw each).

NOTE: Paper size positions are shown on the bottom of the cassette.

3. Apply the proper paper size decals on the cassette at the positions shown.
4. Insert actuator magnets in the slots on the front of the cassette.

NOTE: The magnet position table is also embossed on the back side of the cassette.

5. Load paper in the cassette, replace the cassette cover, and insert the cassette in the cassette entrance.
6. Make copies. Check scanner return position and the copy image.

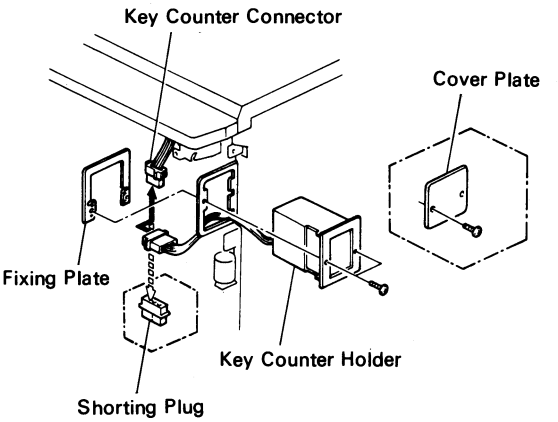


3C. Key Counter Holder Installation

1. Remove the front right cover (2 screws).
2. Open the front cover and remove the inner cover (4 screws). [FT3020]
   Open the front cover, push the slide unit to the left, and remove the inner cover (5 screws). [FT3050/FT3060]
3. Remove the cover plate and fixing plate from the key counter bracket.
4. Hold the fixing plate on the inside of the key counter bracket and insert the key counter holder.
5. Align the holes in the fixing plate with the mounting holes of the key counter holder and secure the key counter holder.

NOTE: This copier can use three types of counter. Make sure to use the correct holes in the fixing plate.

6. Remove the shorting plug from the key counter connector.
7. Plug in the key counter holder.
8. Reassemble the copier and check key counter operation.



SECTION 4

PREPARATIONS FOR TRANSPORTING THE COPIER

4. PREPARATIONS FOR TRANSPORTING THE COPIER

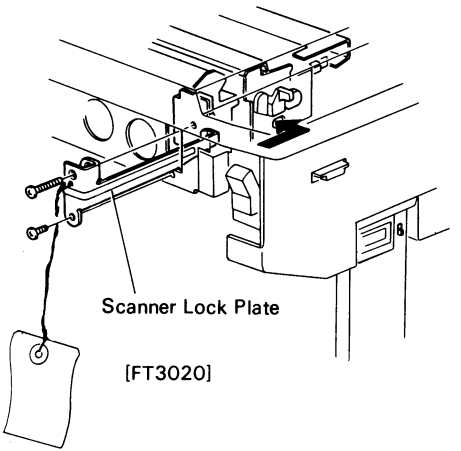
4A. Preparation for Transporting the Copier [FT3020] 4-1

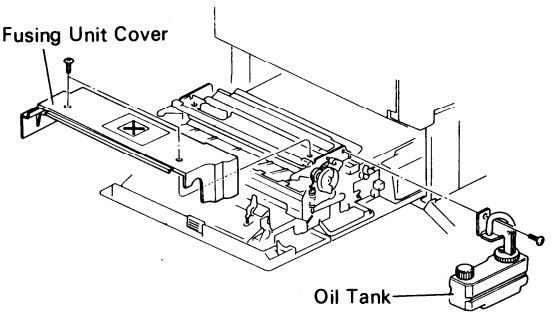
4B. Preparation for Transporting the Copier [FT3050/FT3060] 4-3

4A. Preparations for Transporting the Copier [FT3020]

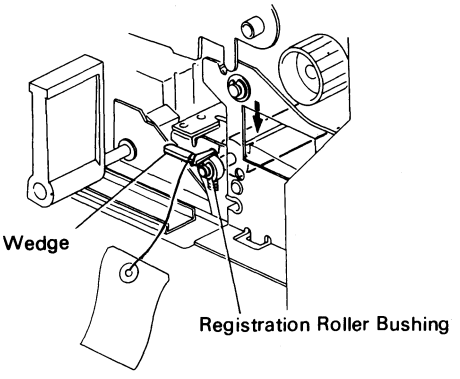
Before moving the copier from its place of installation, be sure to prepare it for transportation as follows. The copier may be badly damaged if it is moved without proper preparation.

1. Take off the left cover (3 screws) and fix the scanner in the home position with the scanner lock plate. (ABSOLUTELY NECESSARY)
2. Remount the left cover.
3. Push the slide unit to the left and remove the fusing unit cover (2 screws).
4. Take out the oil tank (1 screw) and empty it.
5. Reset the oil tank.
6. Reinstall the fusing unit cover.





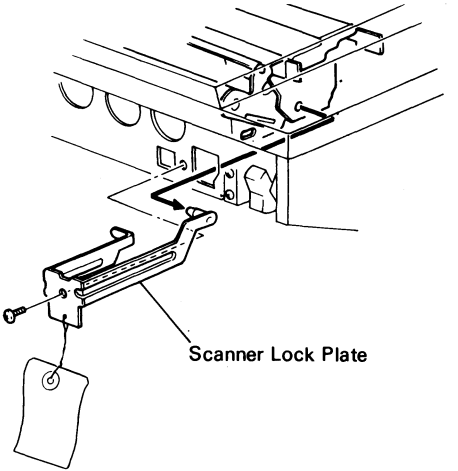
7. Remove the toner collection bottle. Plug it with the rubber lid and transport it separately.
8. Remove the drum and transport it separately in a drum box.
9. Remove the developer and clean the development unit.
10. Clean the cleaning unit.
11. Reinsert the development unit, the cleaning unit, and the drum flange.
12. Reset the drum stay and the charge corona unit.
13. Insert a wedge between the registration roller bushing and the lower registration guide plate.
14. Set the slide unit and tape down the slide unit handle as shown on page 2-2.
15. Fix the front cover, the by-pass feed table, and the platen cover with strips of tape.

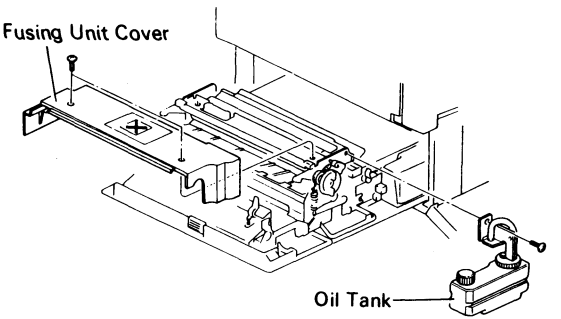


4B. Preparations for Transporting the Copier [FT3050/FT3060]

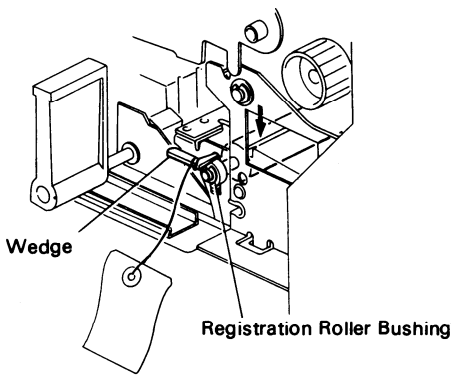
Before moving the copier from its place of installation, be sure to prepare it for transportation as follows. The copier may be badly damaged if it is moved without proper preparation.

1. Take off the left cover (3 screws) and fix the scanner in the home position with the scanner lock plate. (ABSOLUTELY NECESSARY)
2. Remount the left cover.
3. Push the slide unit to the left and remove the fusing unit cover (2 screws).
4. Take out the oil tank (1 screw) and empty it.
5. Reset the oil tank.
6. Reinstall the fusing unit cover.





7. Remove the toner collection bottle. Plug it with the rubber lid and transport it separately.
8. Remove the drum and transport it separately in a drum box.
9. Remove the developer and clean the development unit.
10. Clean the cleaning unit.
11. Reinsert the development unit, the cleaning unit, and the drum flange.
12. Reset the drum stay and the charge corona unit.
13. Insert a wedge between the registration roller bushing and the lower registration guide plate.
14. Set the slide unit and tape down the slide unit handle as shown on page 2-2.
15. Fix the front cover, the by-pass feed table, and the platen cover with strips of tape.



SECTION 5

REMARKS

5. REMARKS

5A. Points to Remember 5-1

5B. Handling the Drum 5-4

5C. Toner Collection Bottle 5-4

5A. Points to Remember

Drum Charge

1. The charge corona wire should be cleaned at every service call by sliding the corona unit.
2. If the corona wire cannot be cleaned using only the wire cleaner, use alcohol. Wipe the corona wire several times in the same direction to remove all toner stains. If copy quality still does not improve, replace the wire.
3. Do not use emery paper for wire cleaning, because the corona wire is carbon coated.
4. Do not touch the corona wire with oily hands.
5. Make sure that the corona wire is correctly positioned between the cleaner pads.
6. After cleaning the charge corona unit, make sure that there are no threads on the casing to avoid white lines on the copy.

Exposure

1. Do not adjust the following parts:
   a. First and Second Scanner Height Adjusting Cams
   b. Scanner Guide Plate
   c. Lens Axis Adjusting Cam
   d. Lens Position Adjusting Screw
   e. Fourth Mirror Angle Adjusting Screw
   f. Exposure Lamp Adjusting Knobs
2. Launa oil or an equivalent oil should be used to lubricate or clean the following parts:
   a. Scanner Guide Rod (Cleaning)
   b. Scanner Guide Rod Pads (Lubrication)
   c. Scanner Guide Plate (Lubrication/ Cleaning)
   d. Lens Drive Screw Shaft (Lubrication) [FT3050/FT3060]

CAUTION: Do not use silicone oil or any other kind of oil.

3. Do not bend or damage the lens support plate or the mylar strip. [FT3050/FT3060]

4. Clean the exposure glass with glass cleaner and dry cloth.
5. Do not touch the following parts with bare hands:
   a. Reflectors
   b. Exposure Lamp
   c. Mirrors and Lens
6. Clean the mirrors with only alcohol or water and a soft cloth.
7. Clean the toner shield glass with glass cleaner at every service call.
8. Secure the left scale with short screws to avoid scanner damage (M4 x 6 — 2 screws).

Development

1. Be careful not to nick or scratch the development roller sleeve.
2. Place a sheet of paper under the development unit when it is out of the copier.
3. Clean the development unit guide plate before reinstalling the unit.

Toner

1. Image density sensor should be cleaned at every EM or PM with a blower brush.
2. Do not touch the sensor pattern with bare hands.
3. Image density sensor adjustment is required when:
   a. A new drum is installed.
   b. The sensor PCB or the upper registration roller cover is moved.
   c. A new sensor is installed.

Cleaning

1. Do not damage the edge of the cleaning blade.
2. Do not touch the cleaning brush with oily hands.
3. Be careful not to damage the drum with the pick-off pawls when pulling out or inserting the cleaning unit.

4. When a new cleaning blade, a new cleaning brush, and/or new cleaning side seals are installed, dust them with setting powder before reinstalling the unit.

5. Toner collected from the cleaning unit can not be used again.

6. Do not adjust the blade stopper screw.

Fusing

1. After replacement of the oil blade, oil supply pad, felt wick and the hot roller, prime with silicone oil to the top of the oil blade.

2. Be careful not to damage the edge of the hot roller strippers or their tension springs.

3. Be careful not to bend the pressure roller strippers.

4. Do not touch the fusing lamp with bare hands.

5. Be sure that the fusing lamp is not in contact with the inner surface of the hot roller.

Paper Feed and Clutches

1. Grease the following parts with Mobil Temp. 78 periodically to avoid noise and bad operation:
   a. Slip Clutch
   b. Paper Feed Clutch
   c. Registration Clutch
   d. Toner Supply Clutch

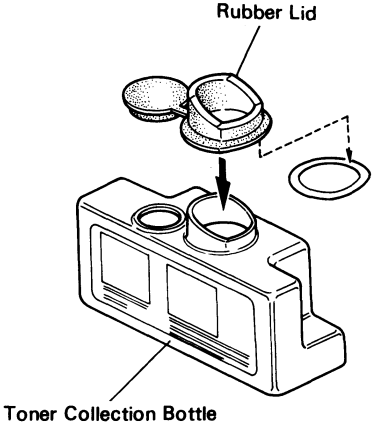
2. Periodically lubricate the paper lift motor worm gear and worm wheel with Launa oil or an equivalent oil.

5B. Handling the Drum

1. Never touch the drum surface with bare hands.
2. Store the drum in a cool dry place.
3. Always prime the drum with setting powder before installing a new drum.
4. To protect the drum, always apply setting powder to a new cleaning blade, a new cleaning brush, and/or new cleaning side seals before installing them.
5. Before installing or pulling out the drum, the cleaning unit, the development unit, and the erase lamp unit should be removed to avoid drum damage.
6. Never set the slide unit without setting the drum stay to avoid drum damage.
7. If a blurred or fuzzy area appears in the center of copies, it may be necessary to clean the drum. (Use RICOH Drum Cleaning Powder. Part No. 54479605)

5C. Toner Collection Bottle

1. Empty the used toner into a vinyl bag at every service call.
2. Teach the customers how to replace the toner collection bottle in case it should become full between service calls.
3. A rubber lid should be on the inside of the front cover.



SECTION 6

REPLACEMENT AND ADJUSTMENT

6. REPLACEMENT AND ADJUSTMENT

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OPTICS

DEVELOPMENT AND TONER SUPPLY

CLEANING

PAPER FEED

TRANSPORT

FUSING

COPY IMAGE

OTHERS

6A. OPTICS

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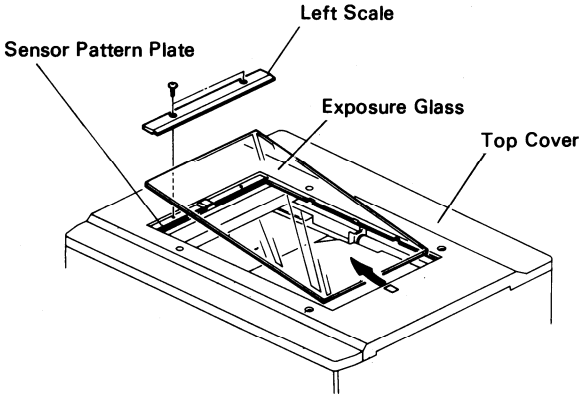
6A-1. Exposure Glass Removal

1. Take off the left scale (2 short screws).
2. Loosen the two screws that tighten down the right side of the top cover.
3. Remove the exposure glass.

NOTE: When installing the left scale:

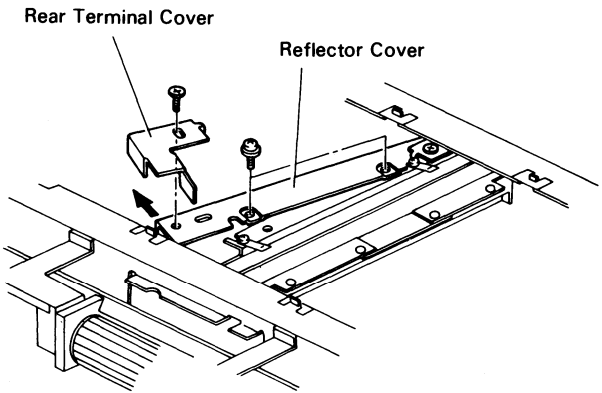
1) make sure the exposure glass is flush with the sensor pattern plate.
2) the left scale must overlap the exposure glass by 10 ± 0.5 mm (0.39" ± 0.02"). [FT3020]



6A-2. Exposure Lamp Replacement [FT3020]

CAUTION: * To avoid warping the scanner, move it by pushing or pulling the wire clamp or drive wire only.
* Do not handle the exposure lamp with your bare hands. Use a strip of paper as shown. (Finger oil marks on the lamp or reflectors will be affected by heat, resulting in discoloration.)

1. Remove the exposure glass and the top cover (10 screws).
2. Move the scanner to the middle.
3. Swing the reflector cover away from the reflector and remove the rear terminal cover (2 screws, 1 flathead screw).
4. Reset the reflector cover without screws and move the scanner to the left (as viewed from the rear) until the lamp is opposite the hole in the optics unit frame.

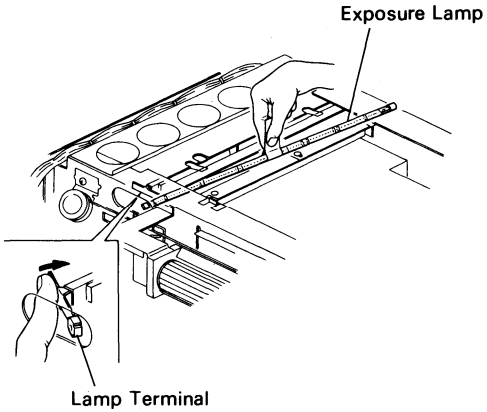


5. Rotate the lamp terminal as shown and take out the lamp.

6. Install a new lamp.

7. Check the lamp position and light intensity.

NOTE: * The blister on the lamp must point toward the mouth of the reflector.

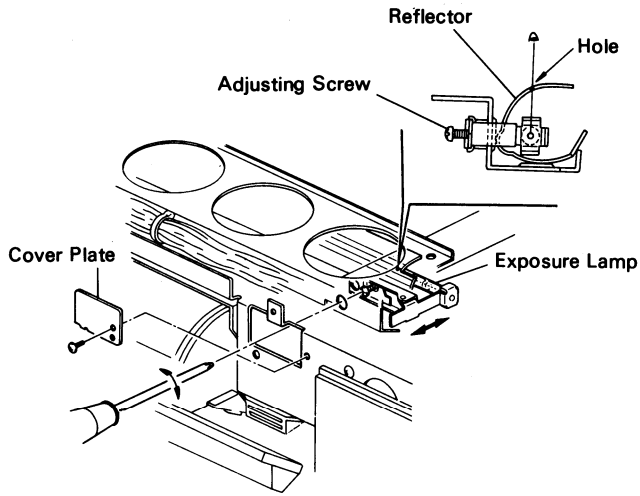


6A-3. Uneven Exposure Adjustment

I. Exposure Lamp Position

1. Remove the top cover and the exposure glass (10 screws).
2. Verify that the lamp is properly seated.
3. Move the scanner to the right.
4. Open the by-pass feed table, the black inner cover, and the toner cartridge holder.
5. Remove the two cover plates (1 screw each).
6. Through the sight holes in the reflector, confirm the lamp filament position (See figure).
7. Correct the horizontal position by tightening or loosening the two adjusting screws.

NOTE: The vertical adjustment is done in production only.



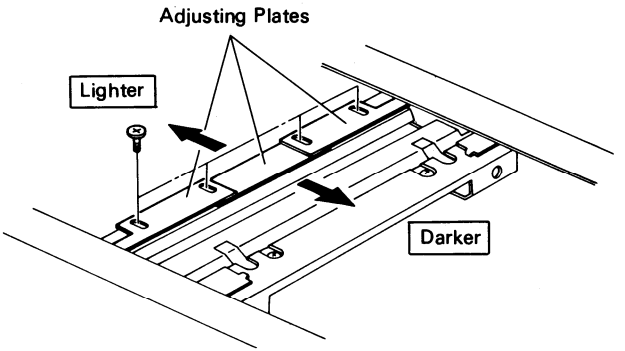
II. Adjusting Plates

If uneven exposure still exists after the above adjustment, do the following:

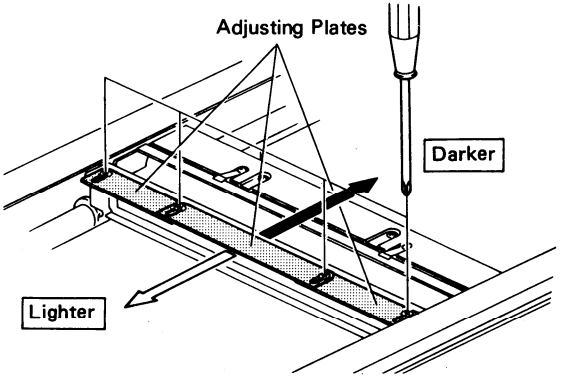
1. Remove the exposure glass.
2. Move the adjusting plates as shown to increase or decrease side illumination.

NOTE: The leading edges of the three adjusting plates must be aligned to avoid white streak.

* Adjustment Standard: The side to side variation of the gray scales should be less than 1 level.



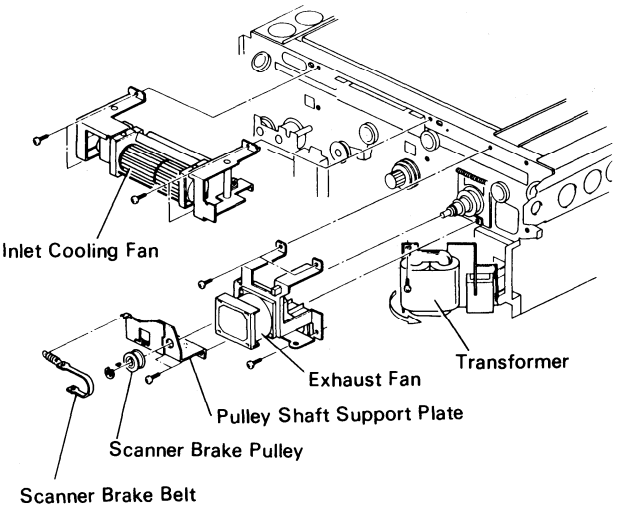
[FT3020]



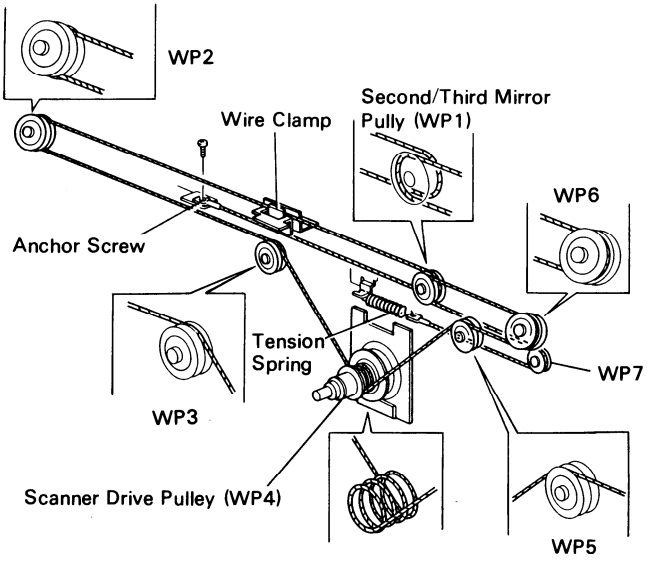
[FT3050/FT3060]

6A-4. Scanner Drive Wire Replacement [FT3020]

1. Take off the Top cover (8 short screws) and left cover (3 screws).
2. Remove the rear cover (2 screws) and the main PCB (2 screws, 4 connectors).
3. Remove the following parts:
   * Exhaust fan (3 screws)
   * Inlet cooling fan (4 screws, connectors as necessary)
   * Transformer (2 screws)
     – just swing to the right on the bracket.
   * Scanner brake belt
   * Scanner brake pulley (1 E-ring, 1 parallel key)
   * Pulley shaft support plate (2 screws)
4. Loosen the wire clamp and take off the old wire.

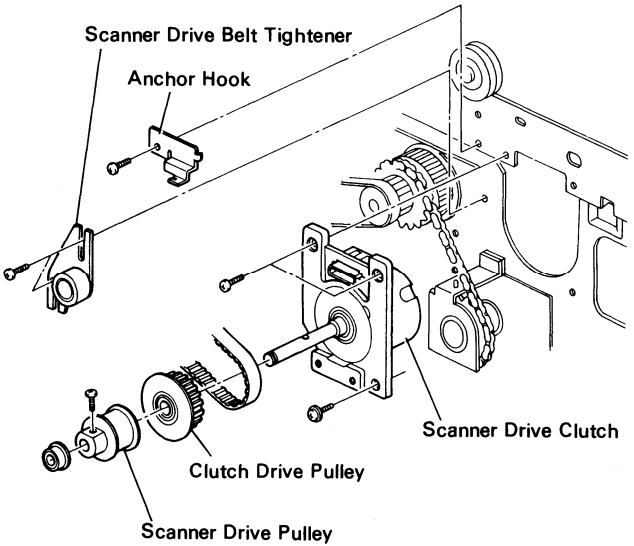


5. Secure one end of the new wire with the anchor screw.
6. Run the wire under the inside track of WP1 and then through the wire clamp to WP2.
7. Next, set the wire in the inside track of WP2 and then run it over the inside track of WP3.
8. Wrap the wire around the scanner drive pulley (WP4) 4 times counterclockwise, starting from the inside edge of the pulley.
9. Then, run the wire over the outside track of WP5 and under the outside track of WP6.
10. Next, run the wire over the outside track of WP1 and around WP7.
11. Hook the free end of the wire to the tension spring.
12. Tighten the wire clamp.
13. Manually rotate the main pulley and check for overlapping of the scanner drive wire.
14. Reassemble the copier.
15. Check and adjust the magnification (See 6G-1).



6A-5. Scanner Drive Clutch Removal [FT3020]

1. Follow Scanner Wire Replacement (6A-4) steps 1 to 4.
2. Slide the bearing and the scanner drive pulley (1 shoulder screw) off of the clutch shaft.
3. Remove the scanner drive belt tightener (2 screws), and slide off the clutch drive pulley.
4. Remove the anchor hook of the wire tension spring (1 screw).
5. Remove the, scanner drive clutch (3 screws, 1 connector).

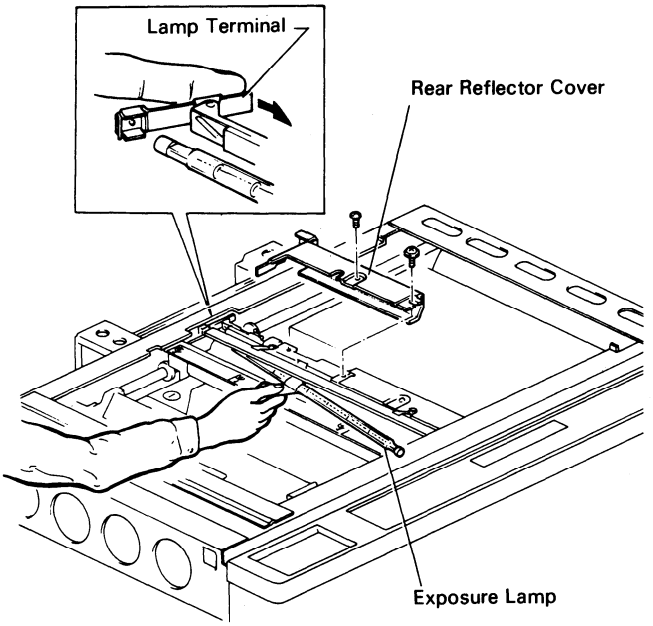


6A-6. Exposure Lamp Replacement [FT3050/FT3060]

CAUTION: * To avoid warping the scanner, move it by pushing or pulling the wire clamp or scanner drive pulley only.
* Do not handle the exposure lamp with your bare hands. Use a strip of paper as shown. (Finger oil marks on the lamp or reflectors will be affected by heat, resulting in discoloration.)

1. Remove the platen cover and the platen cover studs.
2. Remove the top cover and the exposure glass (10 screws).
3. Move the scanner to the position where the frame is cut out.
4. Remove the rear reflector cover (2 screws).
5. Rotate the lamp terminal as shown and take out the lamp.
6. Install a new lamp.
7. Check the lamp position and light intensity.

NOTE: * The blister on the lamp must point toward the mouth of the reflector.

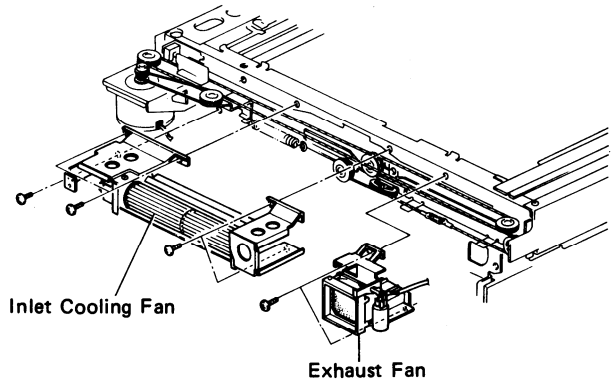


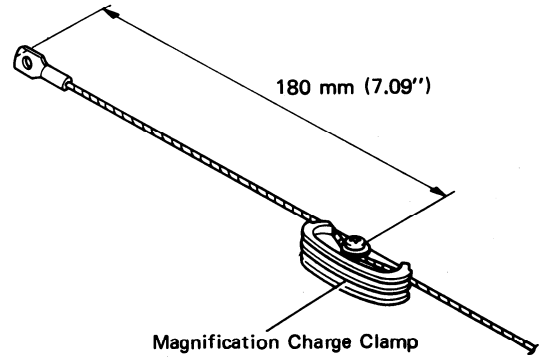
6A-7. Scanner Drive Wire Replacement [FT3050/FT3060]

1. Remove the platen cover and the platen cover mounting studs.
2. Remove the top cover (8 screws).
3. Remove the rear cover (2 screws) and the left cover (3 screws).
4. Remove the following parts;
   * Inlet cooling fan (5 screws, connectors as necessary)
   * Exhaust fan (2 screws)

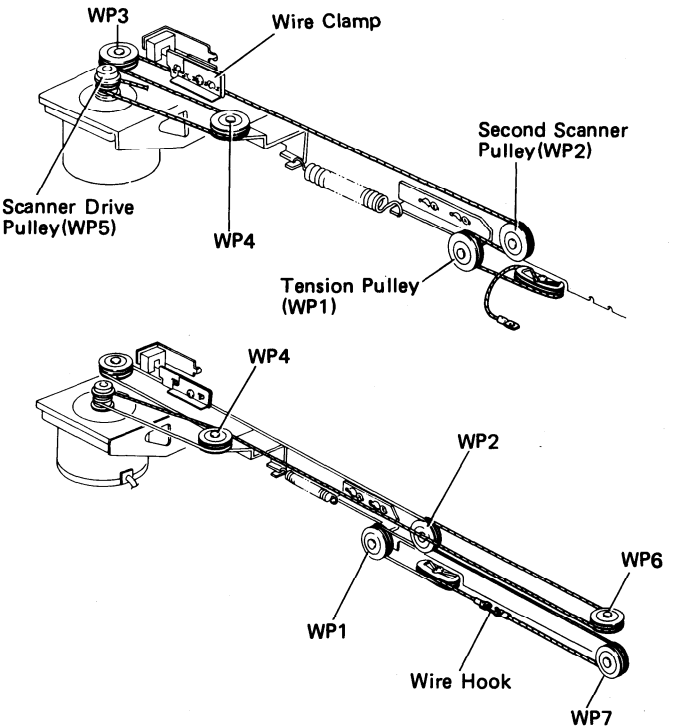
NOTE: All screws on the optics frame installed in the horizontal direction must be short screws (M4 x 6).

5. Unhook the ends of the scanner drive wire.
6. Take out the magnification change clamp and the old wire (1 screw).
7. Clamp the new wire to the magnification change clamp as shown.
   * The left end should be about 180 mm (7.9") long.



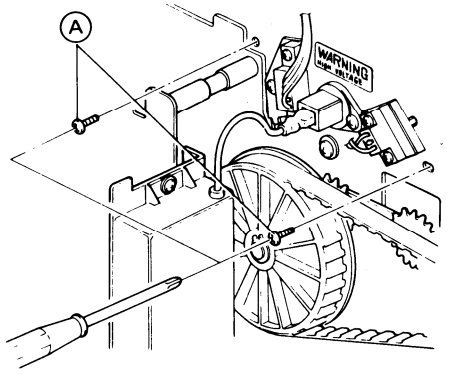


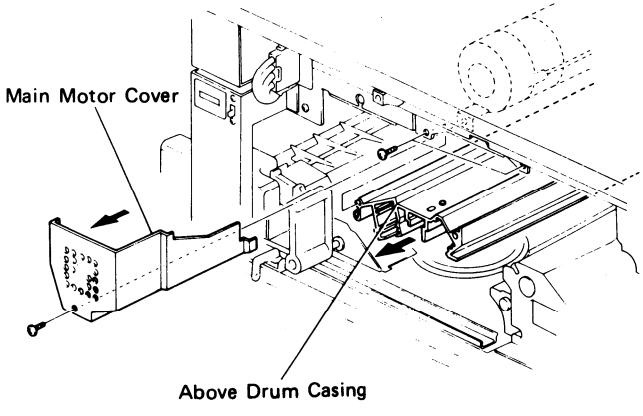
8. Reinstall the magnification change clamp.
9. Move the second scanner to the return position.
10. Working from the clamp, thread the long end of the wire in the lower groove of the clamp and run it under the inside track of the tension pulley (WP1).
11. Then run the wire under the outer track of the second scanner pulley (WP2), through the wire clamp below the screw, and around the lower track of WP3.
12. Run the wire around the lower track of WP4, and then give it two and half (2.5) turns clockwise around the scanner drive pulley, winding from lower to upper.
13. Next, run the wire over the upper track of WP4, the lower track of WP6, the inner track of WP2, and the inner track of WP7.
14. Guide the left end of the wire through the upper groove of the magnification change clamp; then pull the ends of the wire together and join them with the wire hook.
15. Reassemble the copier.
16. Check and adjust the magnification (See 6G-5).



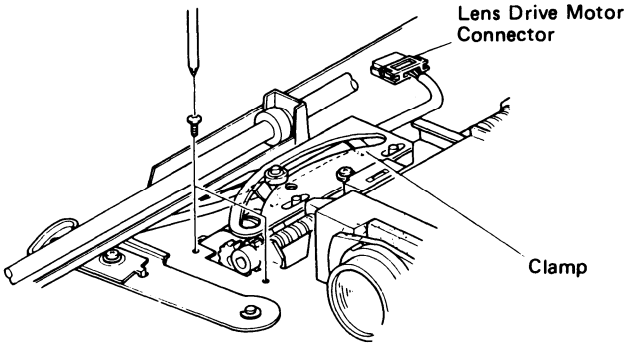
6A-8. Lens Drive Motor Replacement [FT3050/FT3060]

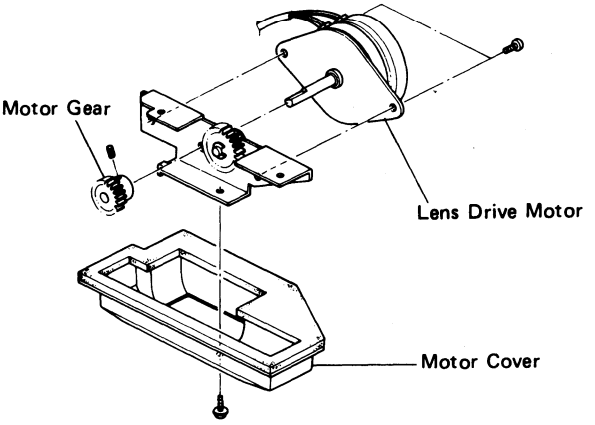
1. Remove the following parts;
   * Charge Corona Unit (1 screw)
   * Drum Stay
   * Development Unit
   * Cleaning Unit
   * Erase Lamp Unit
   * Quenching Lamp Unit
   * Drum Flange and Drum
   * Exposure Glass (4 screws)
2. Take off the rear cover (2 screws) and the optics PCB (1 screw, 4 connectors).
3. Remove the two screws (A) of the above drum casing.
4. Take out the above drum casing (2 screws).
5. Take out the main motor cover (1 screw).





6. Remove the lens housing cover (3 screws).
7. Disconnect the lens drive motor connector and disengage it from the rear side plate.
8. Lift up the clamps holding the lens drive motor harness.
9. Remove the lens drive motor assembly (2 screws).
10. Take off the motor cover (1 screw).
11. Remove the motor gear (1 allen screw).
12. Replace the lens drive motor (2 screw).
13. Reassemble.



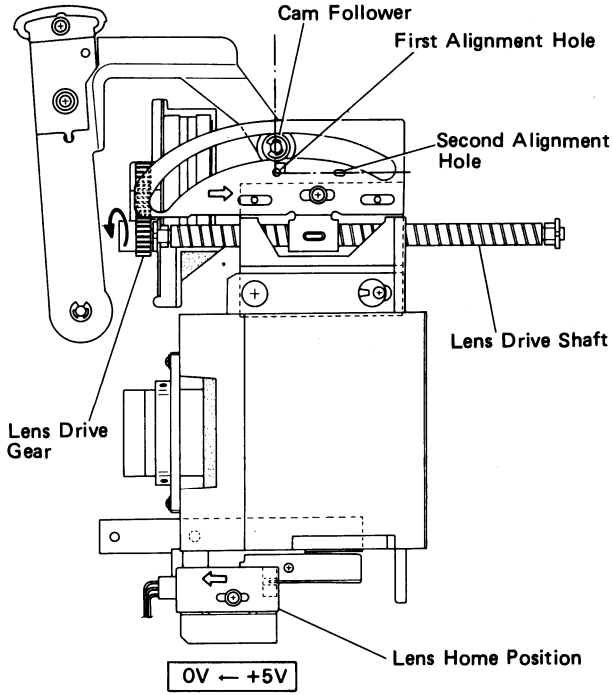


6A-9. Lens Home Position Sensor Adjustment [FT3050/FT3060]

NOTE: When the lens home position sensor is replaced or when horizontal magnification and/or a focus will not improve by adjusting the wire clamp, do this adjustment.

1. Remove the exposure glass (4 screws), the lens housing cover (3 screws), and the rear cover (2 screws).

2. By turning the lens drive gear, move the lens from left to right until it reaches the full size position.
   At the full size position, a line through the center of the cam follower and the first alignment hole will form a right angle with a line through the center of the first and second alignment holes.



3. Open the front cover to prevent the scanner from moving and turn on the main switch.

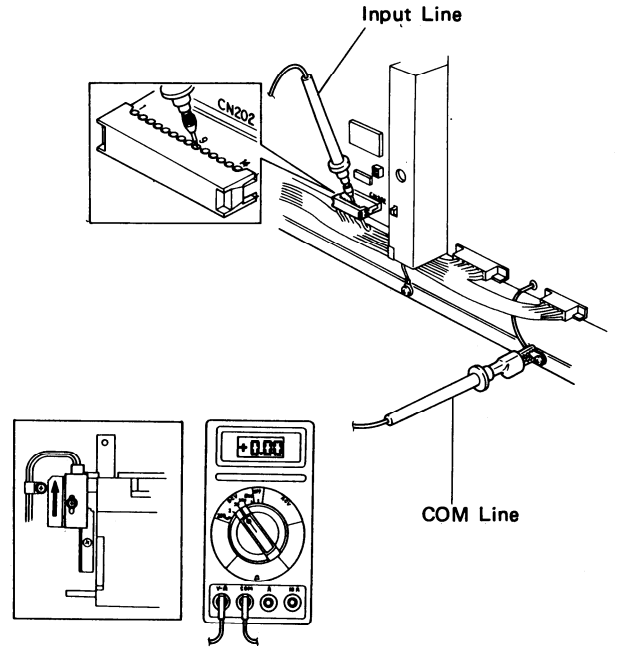
4. Select the DC 20V range of the digital multimeter, and connect the multimeters leads — the COM line to logic ground and the input line to CN202-9 on the optics PCB.

5. Loosen the sensor fixing screw.

6. Slide the sensor as far as possible toward the right.

7. Slowly slide the sensor back until the multimeter reading changes from +5V to 0V. Tighten the sensor screw at this posttion.

8. Make copies and check the horizontal component of magnification and focus.



6B. DEVELOPMENT AND TONER SUPPLY

6B-1. Developer Replacement 6-12

6B-2. Doctor Gap Adjustment 6-13

6B-3. Toner Tank Removal 6-14

6B-4. Image Density Sensor Replacement 6-15

6B-5. Image Density Sensor Adjustment [FT3020] 6-16

6B-6. Toner Supply Clutch Disassembly [FT3020] 6-17

6B-7. Toner Supply Solenoid Adjustment 6-19

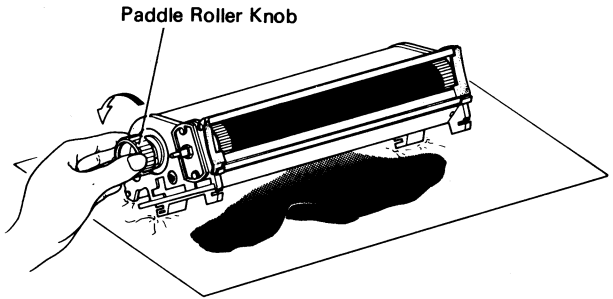
6B-8. Image Density Sensor Adjustment [FT3050/FT3060] 6-20

6B-9. Toner Supply Clutch Disassembly [FT3050/FT3060] 6-20-a

6B-1. Developer Replacement

CAUTION:
* Be careful not to bend the bias terminal.
* Be careful not to damage the upper cover seal.
* After removing used developer, clean the drive gears.

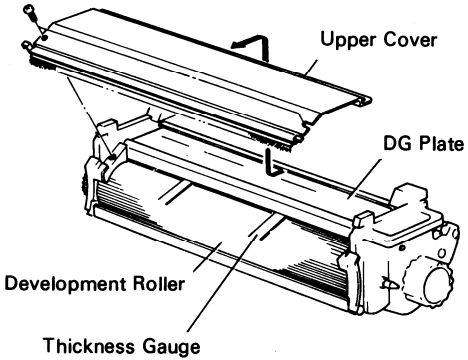
1. Set the development unit on a large sheet of paper with the unit's inlet facing downward.
2. Turn the paddle roller knob counterclockwise. The developer will fall out onto the paper.
3. Hold the unit at an angle and dump out the developer that has collected at the ends of the development unit.
4. Repeat the above steps until you have removed all of the developer.
5. Turn the unit rightside up and pour in one bottle (1 kg) of RICOH TYPE 4000 developer.

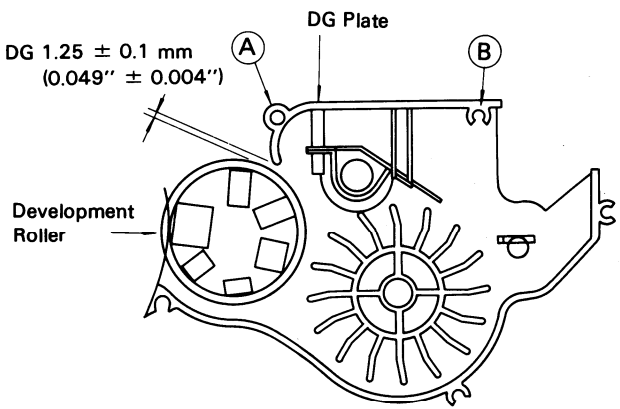


6B-2. Doctor Gap Adjustment

* Adjustment Standard: 1.25 ± 0.1 mm
  (0.049" ± 0.004")

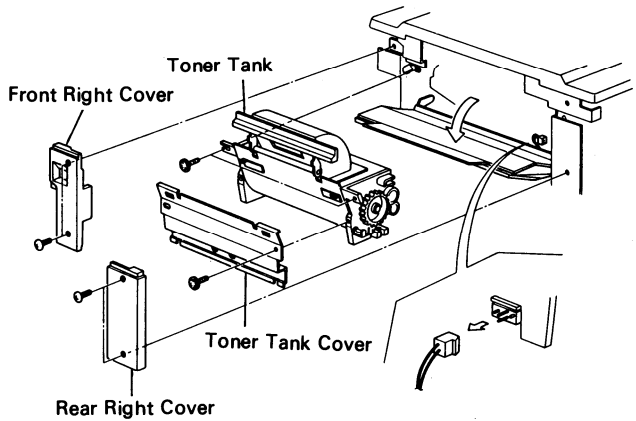
1. Take out the development unit and empty the developer.
2. Take off the upper cover (2 screws).
3. Before making the adjustment, confirm that both surfaces where the thickness gauge will be inserted are clean.
4. **Loosen screws Ⓐ and Ⓑ on both ends.**
5. Insert a 1.25 mm (0.049") thickness gauge into the DG at the shown positions, and press the DG plate down until the doctor blade lightly contacts the thickness guage.
6. **Tighten screws Ⓐ and Ⓑ.**
7. Check that the DG is correct and even.





6B-3. Toner Tank Removal

1. Take out the development unit.
2. Remove the two right covers (2 screws each).
3. Open the by-pass feed table.
4. Lower the inner cover.
5. Remove the toner tank cover (2 screws).
6. Insert a sheet of paper under the toner tank to catch falling toner.
7. Take out the toner tank. (2 screws, 1 connector).

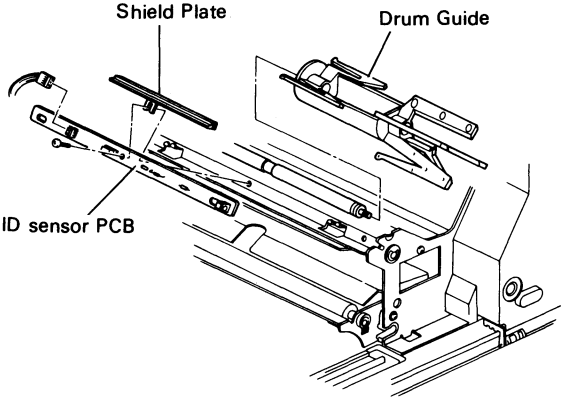


6B-4. Image Density Sensor Replacement

1. Take out the development unit, the cleaning unit, the erase lamp unit, and the drum.
2. Remove the drum guide.
3. Remove the ID sensor PCB (1 screw, 1 connector).
4. Replace the ID sensor.

NOTE: * Make sure the shield plate is set so that it is held firmly by the screw.

* After replacement of the sensor, adjust the ID sensor (See 6B-5).



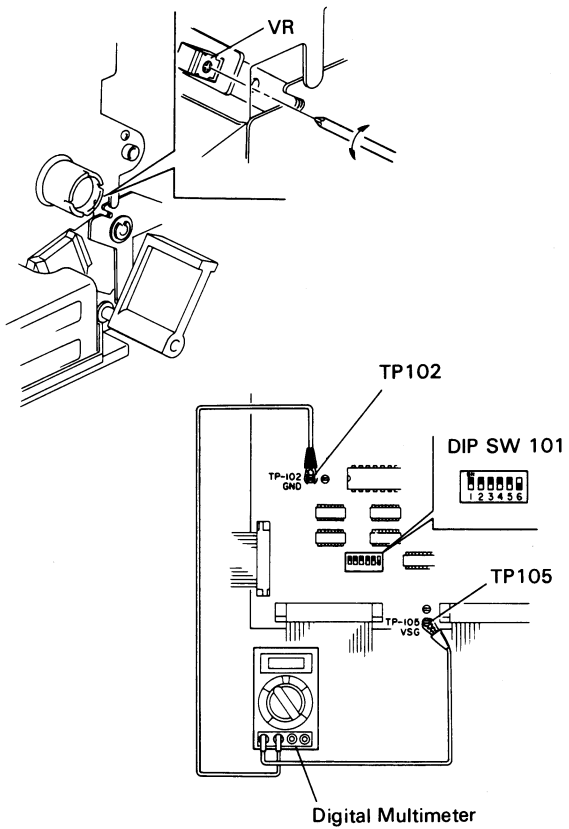
6B-5. Image Density Sensor Adjustment [FT3020]

CAUTION: Before adjusting the ID sensor after new drum installation, cycle the machine about 5 times in Free Run mode to clean the setting powder from the drum.

NOTE: It is better to use a plastic screw driver to avoid possible drum damage.

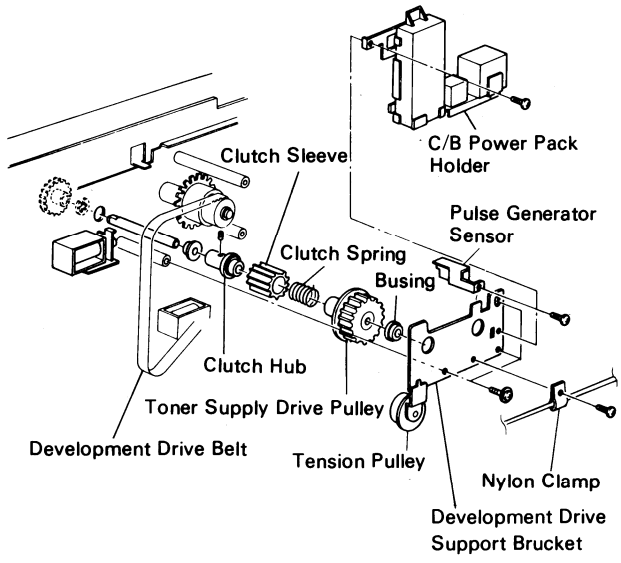
* Adjustment Standard : +3 ± 0.2V

1. Remove the rear cover (2 screws).
2. Connect a multimeter to TP105 (hot line) and TP102 (ground line).
3. Turn on DIP SW101 #6.
4. Open the front cover and turn on the main switch.
5. Adjust the VR on the front end of the ID sensor PCB.



6B-6. Toner Supply Clutch Disassembly [FT3020]

1. Remove the rear cover (2 screws).
2. Remove the main PCB (2 screws, 4 connectors).
3. Remove the C/B power pack holder (1 screw) and the bias lead wire clamp (1 screw).
4. Loosen the screw securing the tension pulley of development unit drive belt.
5. Remove the pulse generator sensor bracket (1 screw).
6. Remove the development drive support bracket (3 screws).
7. Remove the bushing from the toner supply clutch shaft.
8. Take off the toner supply drive pulley by turning it clockwise.

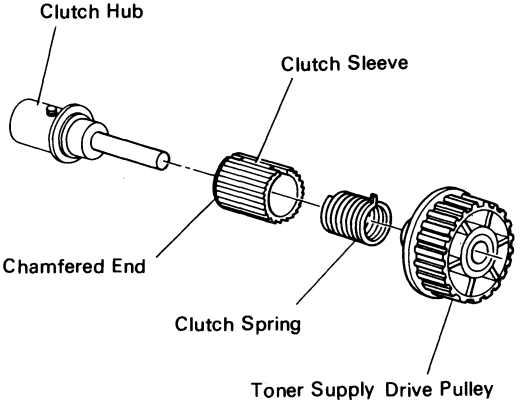


9. Remove the toner supply clutch sleeve and spring together from the clutch hub by turning the sleeve clockwise.

10. Clean the clutch hub, pulley, and spring, and then grease the spring with Mobil Temp 78.

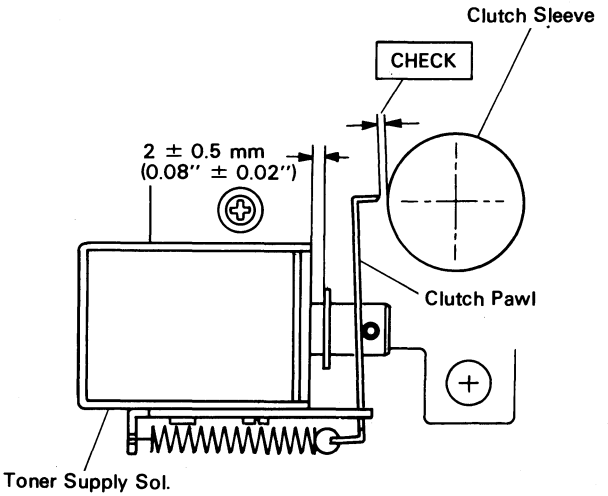
11. Reassemble.

CAUTION: When reassembling, make sure that the chamfered end of the clutch sleeve is to the inside. Also, make sure that the right angle projection of the spring is fitted into the outside notch.



6B-7. Toner Supply Solenoid Adjustment

1. Remove the main PCB (2 screws, 4 connectors). [FT3020]
   Remove the optics PCB (1 screw, 4 connectors). [FT3050/FT3060]
2. Take off the paper feed drive belt tightener (1 screw).
3. Adjust the solenoid stroke to 2 ± 0.5 mm (0.08" ± 0.02") (2 screws).
4. Check that there is at least 1 mm clearance between the clutch pawl and the clutch sleeve when the solenoid is on.



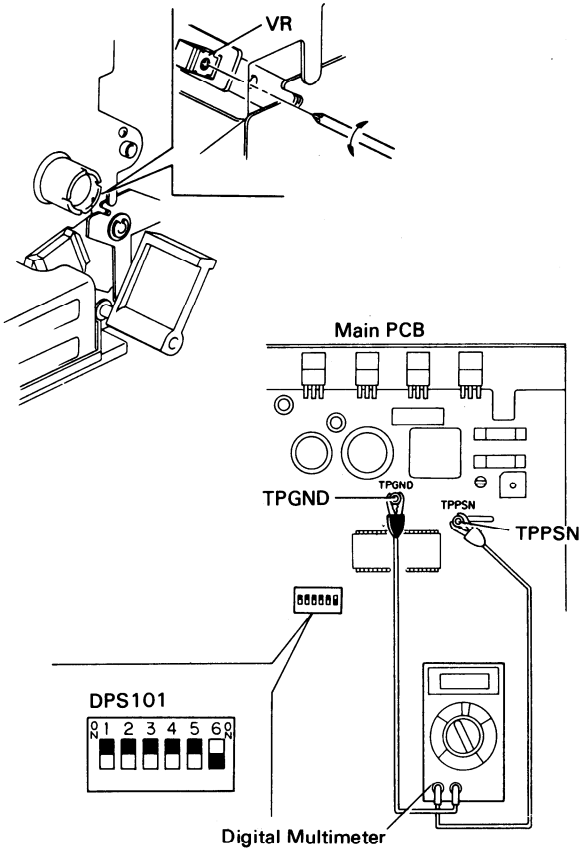
6B-8. Image Density Sensor Adjustment [FT3050/FT3060]

CAUTION: Before adjusting the ID sensor after new drum installation, cycle the machine about 5 times in Free Run mode to clean the setting powder from the drum.

NOTE: It is better to use a plastic screw driver to avoid possible drum damage.

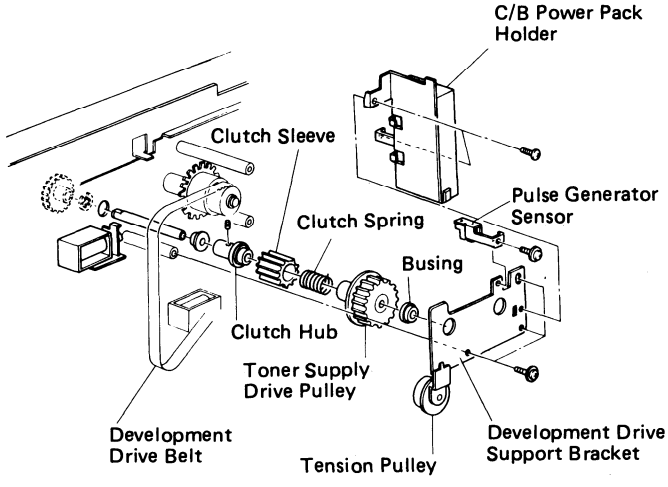
* Adjustment Standard : +4 ± 0.2V

1. Remove the rear cover (2 screws).
2. Connect a multimeter to TPPSN (hot line) and TPGND (ground line) on the main PCB.
3. Turn on DIP SW101 #6.
4. Open the front cover and turn on the main switch.
5. Adjust the VR on the front end of the ID sensor PCB.



6B-9. Toner Supply Clutch Disassembly [FT3050/FT3060]

1. Remove the rear cover (2 screws).
2. Remove the optics PCB (1 screw, 4 connectors).
3. Remove the C/B power pack holder (1 screw) and the bias lead wire clamp (1 screw).
4. Loosen the screw securing the tension pulley of development unit drive belt.
5. Remove the pulse generator sensor bracket (1 screw).
6. Remove the development drive support bracket (3 screws).
7. Remove the bushing from the toner supply clutch shaft.
8. Take off the toner supply drive pulley by turning it clockwise.

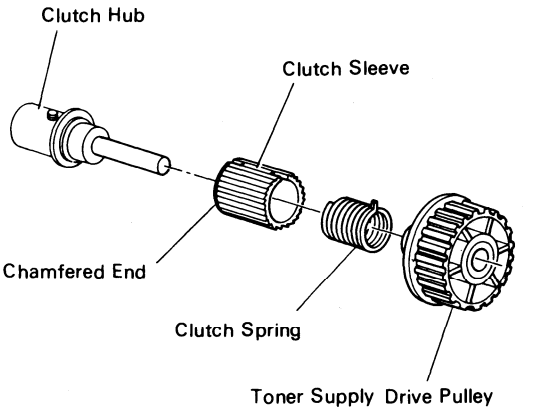


9. Remove the toner supply clutch sleeve and spring together from the clutch hub by turning the sleeve clockwise.

10. Clean the clutch hub, pulley, and spring, and then grease the spring with Mobil Temp 78.

11. Reassemble.

CAUTION: When reassembling, make sure that the chamfered end of the clutch sleeve is to the inside. Also, make sure that the right angle projection of the spring is fitted into the outside notch.



6C. CLEANING

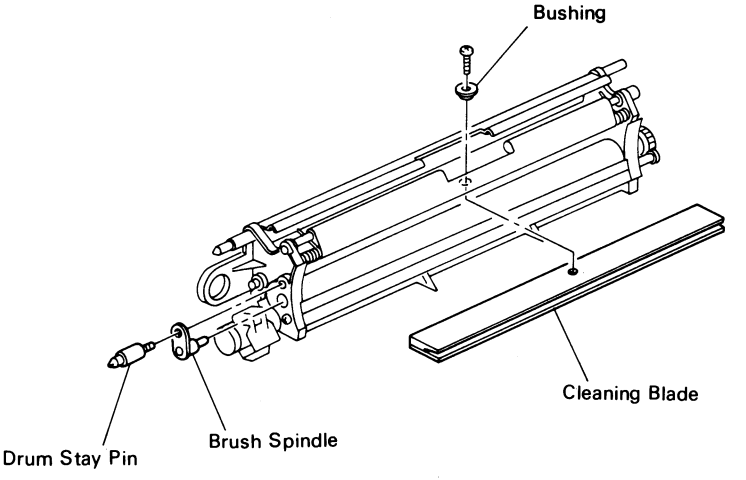
6C-1. Cleaning Blade and Brush Replacement 6-22

6C-2. Pick-off Pawl Replacement 6-24

6C-3. Helical Coil Replacement 6-25

6C-1. Cleaning Blade and Brush Replacement

1. Take out the cleaning unit.
2. Remove the old blade (1 screw).
3. Remove the drum stay pin.
4. Remove the brush spindle.



5. Stand the unit up on the toner return pipe as shown; press the brush down against the cushion, and take it out.

6. Clean the unit.

7. Check all seals, including the inner mylar seal. Replace any that are damaged.

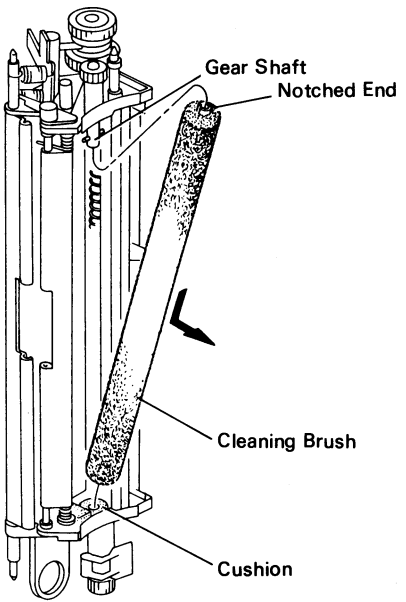
8. Install a new cleaning brush.

NOTE: The notched end must fit over the pin on the gear shaft.

9. Install the new blade.

NOTE: Make sure the bushing fits in the hole of the blade holder.

10. Dust the edge of the new blade and the cleaning brush with setting powder.

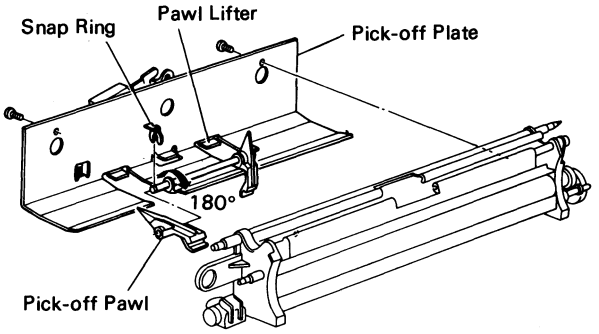


6C-2. Pick-off Pawl Replacement

CAUTION: Be careful not to damage the edge of new pawls.

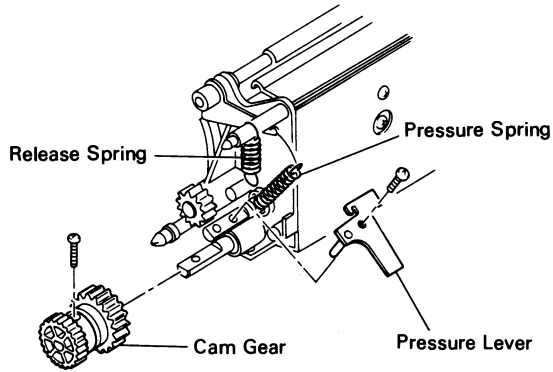
1. Remove the pick-off plate (2 screws).
2. Remove the snap rings from the ends of the pick-off pawl shaft.
3. Rotate the pawls 180° and slip them off the ends of the shaft as shown.
4. Install new pawls.

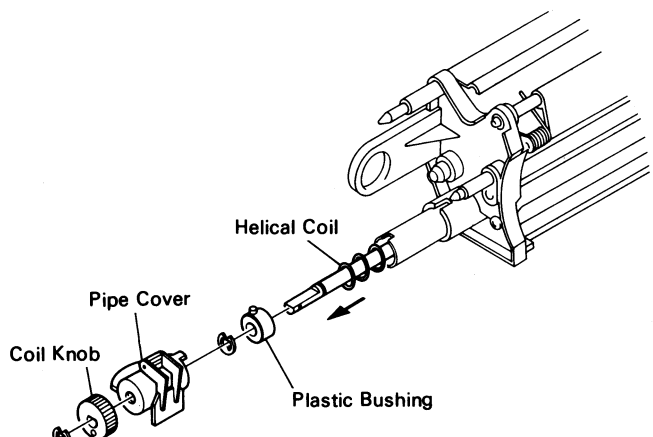
NOTE: Make sure that the weighted end of each pawl rests on the pawl lifter.



6C-3. Helical Coil Replacement

1. Unhook the pressure and release springs.
2. Take off the pressure lever (1 screw).
3. Take off the cam gear (1 screw).
4. Remove the coil knob (1 E-ring) and slide off the plastic pipe-cover.
5. Pull out the helical coil.
6. Take off the E-ring and plastic bushing, and mount them on a new helical coil.
7. Install the new coil.





6D. PAPER FEED

6D-1. Roller Replacement

I. Pick-up Roller and Feed Roller 6-28

II. Separation Roller and Slip Clutch 6-29

6D-2. Paper Size Detector Replacement 6-30

6D-3. Paper Lift Detector Adjustment 6-31

6D-4. Paper End Detector Adjustment 6-32

6D-5. Paper Feed Solenoid and Registration Solenoid Adjustment 6-34

6D-6. Paper Feed Clutch Disassembly 6-35

6D-7. Registration Clutch Disassembly 6-37

6D-8. By-pass Feed Table Removal 6-39

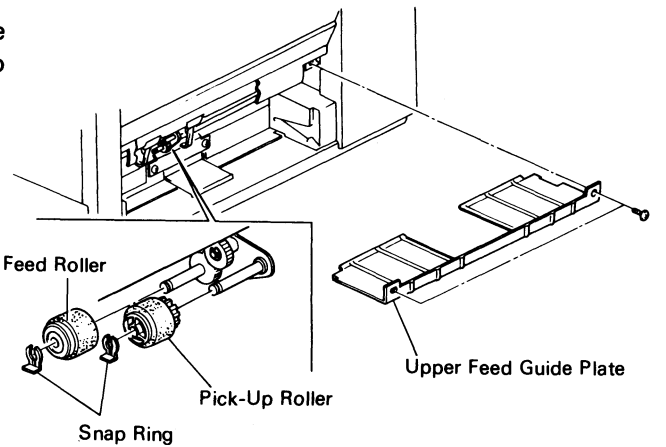
6D-9. Paper Feed Sensor Replacement 6-40

6D-1. Roller Replacement

I. Pick-up Roller and Feed Roller.

1. Remove the upper feed guide plate (2 screws).
2. Remove the snap ring and slide off the pick-up roller.
3. Remove the snap ring and slide off the feed roller.

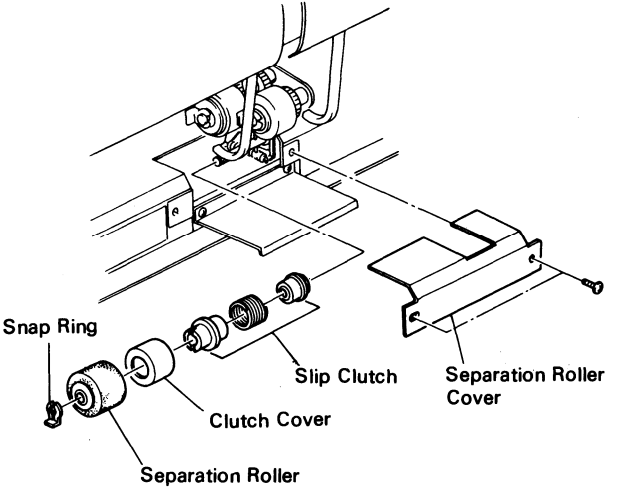
NOTE: The feed roller must be installed with the beveled edge of the one-way bearing to the left.



II. Separation Roller & Slip Clutch

1. Remove the separation roller cover (2 screws).
2. Take off the snap ring and slide the separation roller off the shaft.
3. Slide the slip clutch off the shaft.
4. Clean the clutch and grease it with Mobil Temp 78.

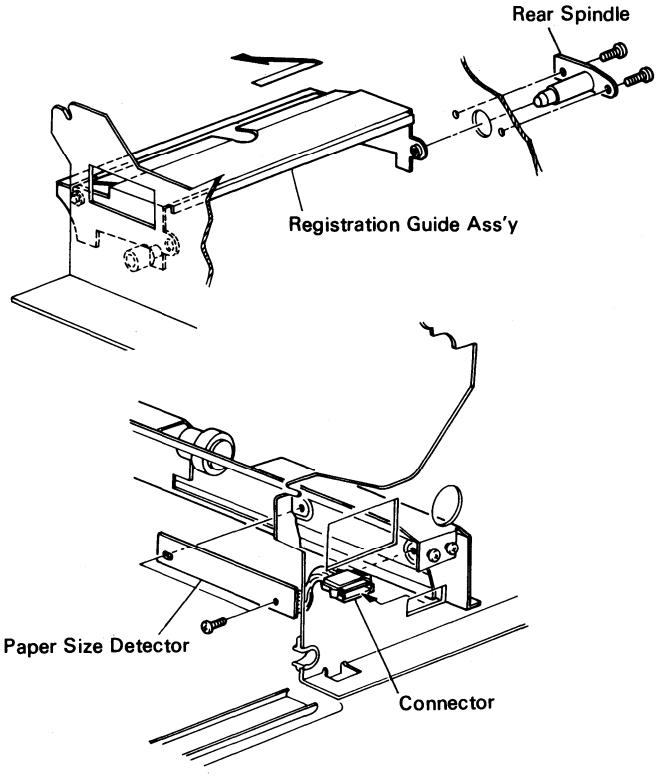
NOTE: Put Mobil Temp 78 into the three holes of the clutch hub.



6D-2. Paper Size Detector Replacement

1. Push the slide unit to the left.
2. Take off the rear cover (2 screws).
3. Remove the main PCB (2 screws, 4 connectors). [FT3020]
   Remove the optics PCB (1 screw, 4 connectors). [FT3050/FT3060]
4. Remove the rear spindle of the registration guide assembly (2 screws).
5. Take out the registration guide assembly.
6. Remove the front inner cover (4 screws).
7. Uncouple the connector and free it from the front side plate.
8. Remove the paper size detector PCB (2 screws).

NOTE: The PCB can be viewed through the left side (slide unit) opening.

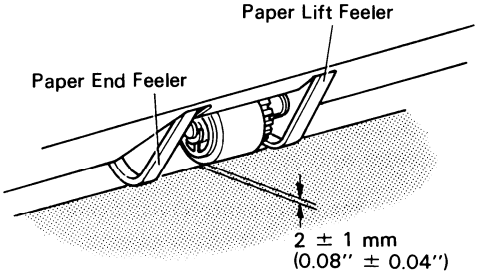


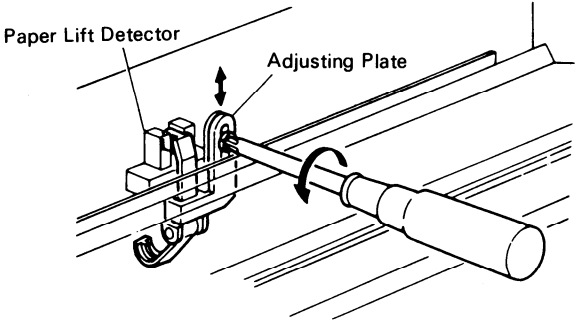
6D-3. Paper Lift Detector Adjustment

1. Load about 20mm (0.8") of paper into the cassette and set it to the copier.
2. Turn on the main switch.
3. Check the clearance between the pick-up roller and the paper.

* If it is 2 ± 1 mm (0.08" ± 0.04"), the following steps are unnecessary.

4. Open the by-pass feed table and the inner cover.
5. Remove the toner tank cover (2 screws).
6. Move the adjusting plate of the paper lift detector up or down until the clearance is 2 ± 1 mm (0.08" ± 0.04").
7. Close the inner cover and the by-pass feed table, and check the clearance between the pick-up roller and the paper.
8. Remove all the paper from the cassette and check the clearance again.



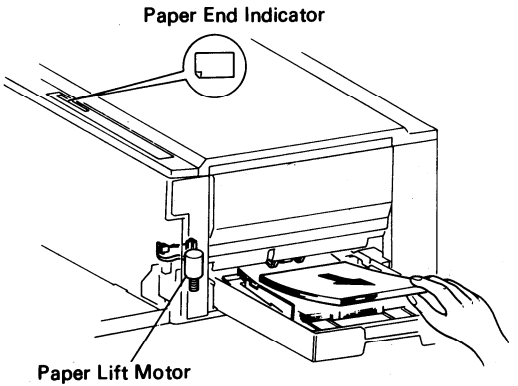


6D-4. Paper End Detector Adjustment

After adjusting the paper lift detector do this adjustment.

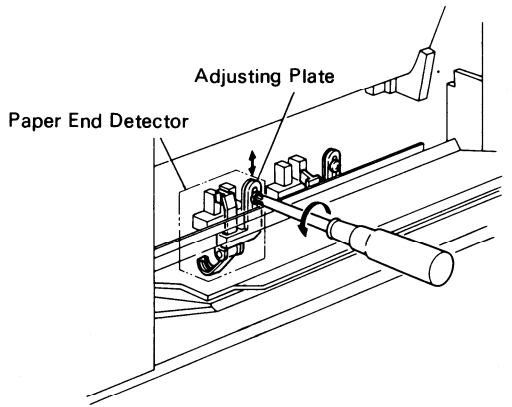
1. Load about 20 mm (0.8") of paper in the cassette and set it in the copier.
2. Turn on the main switch with the by-pass feed table and the front cover closed.
3. Open the front cover.
4. Remove sheets of paper little by little until the paper end indicator lights up.
5. Measure the thickness of the stack of removed paper.

* If it is 3 ± 1 mm (0.12" ± 0.04"), the following steps are unnecessary.



6. Open the by-pass feed table and the inner cover.
7. Remove the toner tank cover (2 screws).
8. Move the adjusting plate of the paper end detector up or down by the amount that the measurement was out of standard in step 5.
9. Close the inner cover and the by-pass feed table.
10. Reload the paper you removed in step 4.
11. Close the front cover to lift the paper.
12. Repeat the above steps from 3.

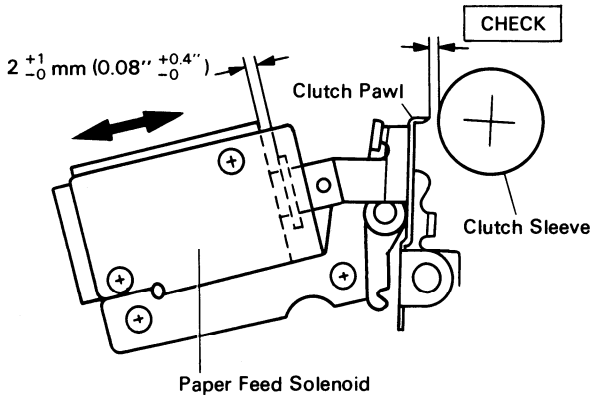
NOTE: Check the operation of paper end detector with both the cassette and the by-pass feed table.



6D-5. Paper Feed Solenoid and Registration Solenoid Adjustment

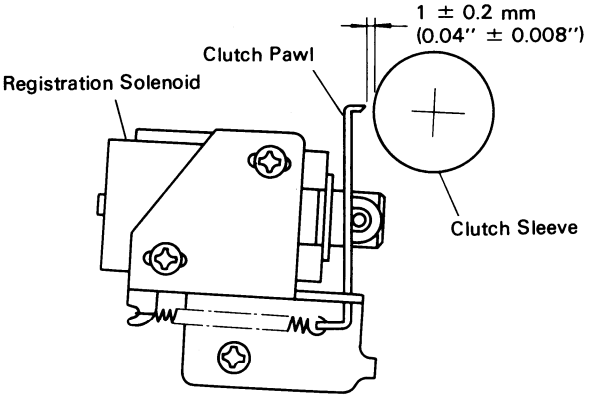
I. Paper Feed Solenoid

1. Adjust the solenoid stroke to $2 \begin{smallmatrix}+1\\-0\end{smallmatrix}$ mm ($0.08'' \begin{smallmatrix}+0.04''\\-0\end{smallmatrix}$).
2. Check that there is some clearance between the clutch pawl and the clutch sleeve when the solenoid is on.



II. Registration Solenoid

1. Adjust the solenoid position to make a 1 ± 0.2 mm (0.04" ± 0.008") gap between the clutch pawl and the clutch sleeve when the solenoid is on.

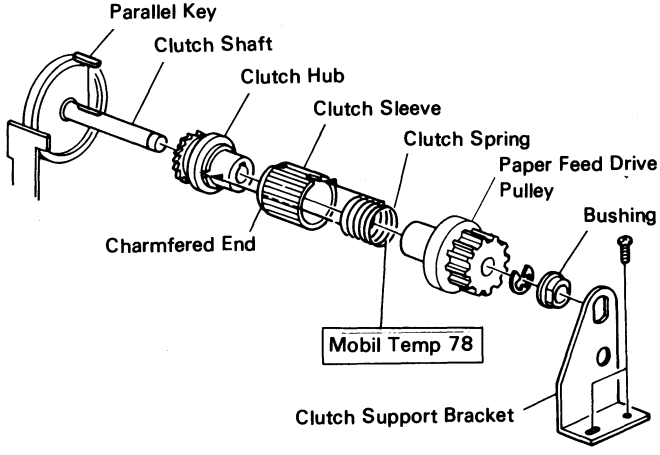


6D-6. Paper Feed Clutch Disassembly

1. Remove the rear cover (2 screws).
2. Remove the main PCB (2 screws, 4 connectors). [FT3020]
   Remove the optics PCB (1 screw, 4 connectors). [FT3050/FT3060]
3. Loosen the belt tension pulley (1 screw).
4. Remove the paper feed clutch support bracket (2 screws) and the bushing.
5. Take the timing belt off of the paper feed drive pulley.
6. Pushing the clutch pawl to the left, slide the paper feed clutch assembly off the clutch shaft (1 E-ring).

CAUTION: Be careful not to lose the parallel key.

7. Hold the clutch hub and, take off the paper feed drive pulley by turning the pulley clockwise.



8. Take the clutch sleeve and spring off of the clutch hub.

CAUTION: Be careful not to damage the clutch spring.

9. Clean the clutch hub, pulley, and spring.

10. Grease the clutch spring with Mobil Temp 78.

11. Reassemble.

CAUTION:

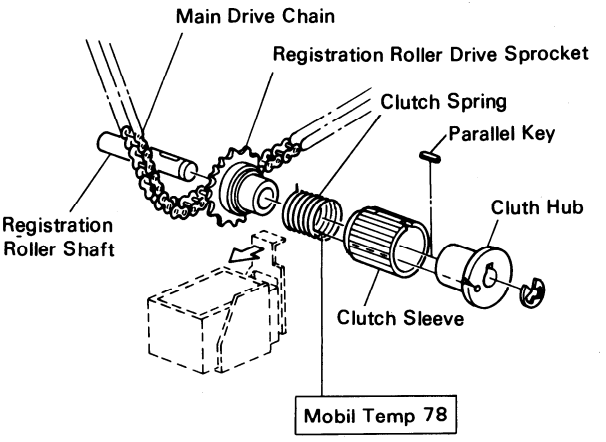
* When reassembling, make sure that the projections on the clutch are engaged with the clutch hub and the clutch sleeve.

* Also, make sure that the chamfered end of the clutch sleeve is to the inside.

* When installing the paper feed clutch assembly on the clutch shaft, pull up the ratchet pawl to set the clutch correctly.

6D-7. Registration Clutch Disassembly

1. Remove the rear cover (2 screws).
2. Remove the main PCB (2 screws, 4 connectors). [FT3020]
   Remove the optics PCB (1 screw, 4 connectors). [FT3050/FT3060]
3. Unhook the tension spring of the main drive chain.
4. Remove the main drive chain from the registration roller drive sprocket.
5. Remove the E-ring from the registration roller shaft.
6. Slide off the clutch hub with the clutch sleeve and spring while turning the registration roller drive sprocket clockwise.
7. Remove the parallel key.
8. Pushing the registration clutch pawl to the left, take off the registration roller drive sprocket.



9. Clean the clutch parts and grease the clutch spring with Mobil Temp 78.

10. Reassemble.

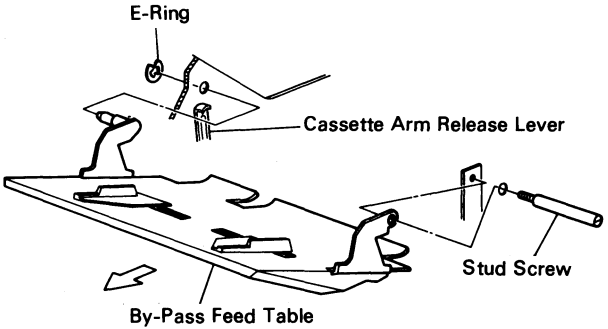
CAUTION: * When reassembling make sure that the projections on the clutch spring are engaged with the clutch hub and the clutch sleeve.

* Also, make sure that the chamfered end of the clutch sleeve is to the inside.

6D-8. By-pass Feed Table Removal

1. Open the front cover and remove the front inner cover (4 screws). [FT3020]
   Open the front cover, push the slide unit to the left, and remove the inner cover (5 screws). [FT3050/FT3060]
2. Remove the E-ring from the front shaft of the by-pass feed table.
3. Remove the right rear cover (2 screws)
4. Open the by-pass feed table and remove the inner cover and the toner tank cover (2 screws).
5. Remove the rear cover (2 screws) and the main PCB (2 screws, 4 connectors). [FT3020]
   Remove the rear cover (2 screws) and the optics PCB (1 screw, 4 connectors). [FT3050/FT3060]
6. Remove the stud screw from the rear side.
7. Take off the by-pass feed table. [FT3020]
   (1 connector, 1 bushing) [FT3050/FT3060]

CAUTION: When reinstalling, do not damage the cassette arm release lever nor the by-pass feed table sensor.

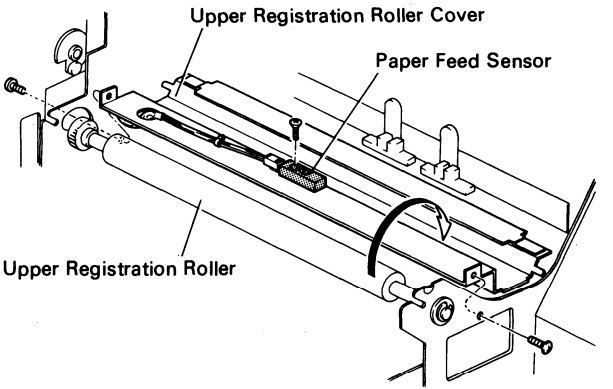


6D-9. Paper Feed Sensor Replacement

CAUTION: Be careful not to damage the mylar seal.

1. Open the front cover and remove the following parts:
   * Charge Corona Unit
   * Drum Stay
   * Development Unit
   * Cleaning Unit
   * Erase Lamp Unit
   * Drum Flange and Drum
2. Remove the rear cover (2 screws) and the main PCB (2 screws, 4 connectors).
3. Remove the upper registration roller cover (2 screws).
4. Turn over the upper registration roller cover and replace the paper feed sensor (1 screw).

NOTE: After replacement of the paper feed sensor adjust the ID sensor.



6E. TRANSPORT

6E-1. Slide Unit Removal 6-42

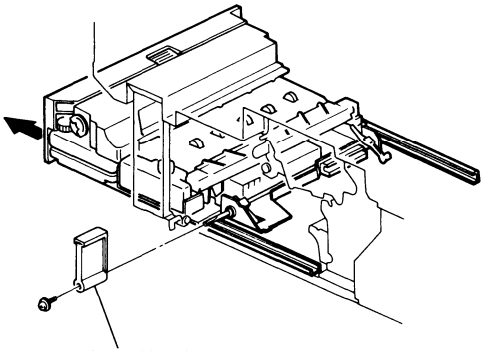
6E-2. T/S Power Pack Replacement 6-43

6E-3. Transport Roller Replacement 6-44

6E-1. Slide Unit Removal

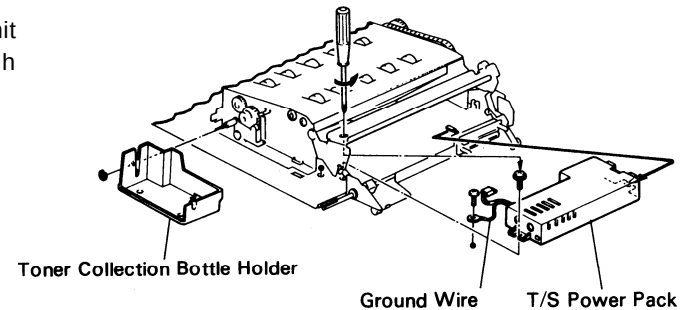
1. Push the slide unit to the left.
2. Take off the slide unit handle (1 screw).
3. Take the slide unit out of the machine.

CAUTION: When reinstalling the slide unit, make sure the two accurides are set correctly.



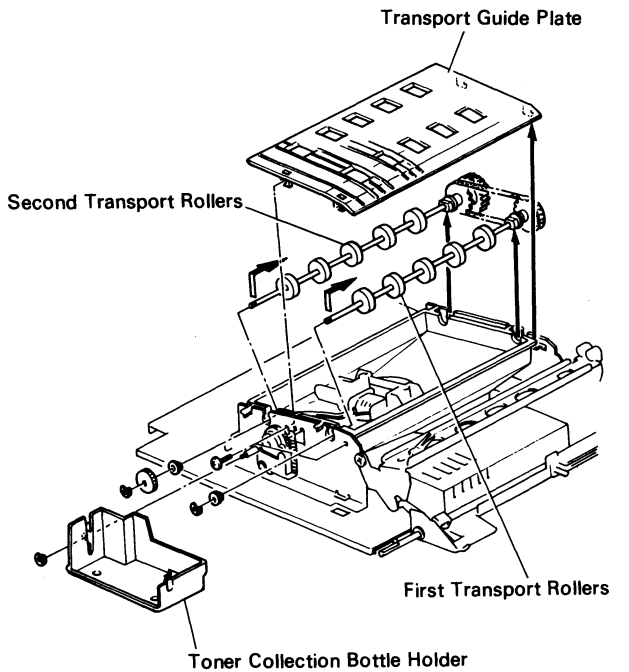
6E-2. T/S Power Pack Replacement

1. Remove the slide unit (See 6E-1).
2. Take off the toner collection bottle holder (1 E-ring).
3. Unscrew the ground wire.
4. Remove the power pack from the slide unit base plate (1 screw, 1 connector, 2 high voltage lines).
5. Replace the T/S power pack.



6E-3. Transport Roller Replacement

1. Take out the slide unit (See 6E-1).
2. Take the fusing unit off the slide unit (See 6F-1).
3. Remove the toner collection bottle holder (1 E-ring).
4. Remove the transport guide plate (2 screws).
5. Remove the gear and bushings from the front ends of the first and second roller shafts (2 E-rings).
6. Release the tightener from the hook link chain; then, slide the roller shafts slightly to the rear to free the bushings and lift off the two shafts.
7. Remove the sprockets, clutch, etc. from the ends of the shafts and install them on the shafts of the new rollers.
8. Reassemble.



6F. FUSING

6F-1. Fusing Unit Removal 6-46

6F-2. Cleaning Pad Removal 6-47

6F-3. Oil Supply Pad Replacement 6-48

6F-4. Oil Blade Replacement 6-49

6F-5. Hot Roller Replacement 6-50

6F-6. Pressure Roller Replacement 6-52

6F-7. Hot Roller Stripper Replacement 6-53

6F-8. Pressure Roller Stripper Replacement 6-54

6F-9. Thermistor Replacement 6-55

6F-10. Thermofuse Replacement 6-56

6F-11. Felt Wick Replacement 6-57

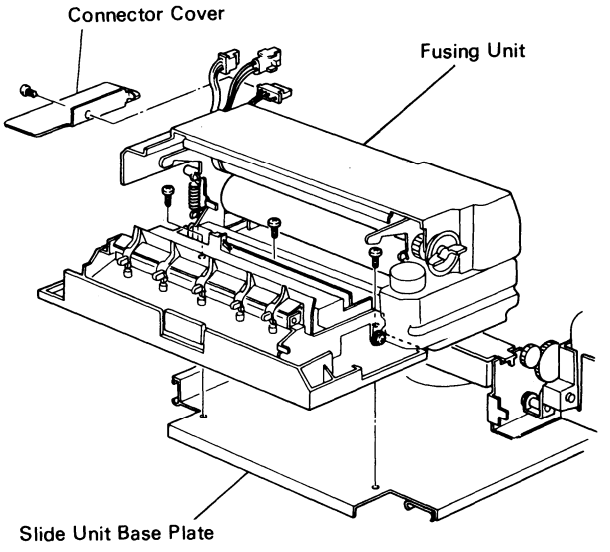
6F-12. Checking Hot Roller Temperature 6-58

6F-13. Fusing Temperature Selection and Fusing Control Unit Replacement 6-59

6F-1. Fusing Unit Removal

1. Push the slide unit to the left.
2. Remove the connector cover (1 screw) and uncouple the three fusing unit connectors.
3. Lower the exit assembly and the exit guide plate.
4. Remove the fusing unit from the slide unit base plate (3 screws).

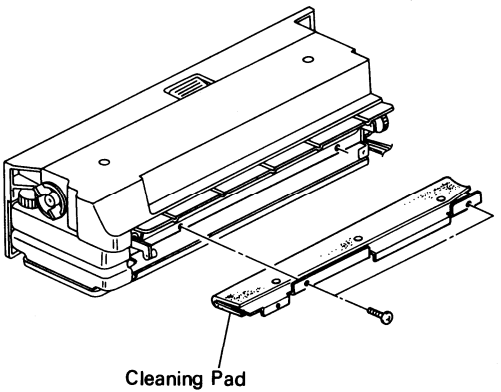
NOTE: * When reinstalling this unit, make sure that it sets properly on the positioning stud (rear).
* Check that the gears are well engaged.



6F-2. Cleaning Pad Replacement

1. Remove the fusing unit (See 6F-1).
2. Remove the cleaning pad (2 screws).
3. Install a new pad.

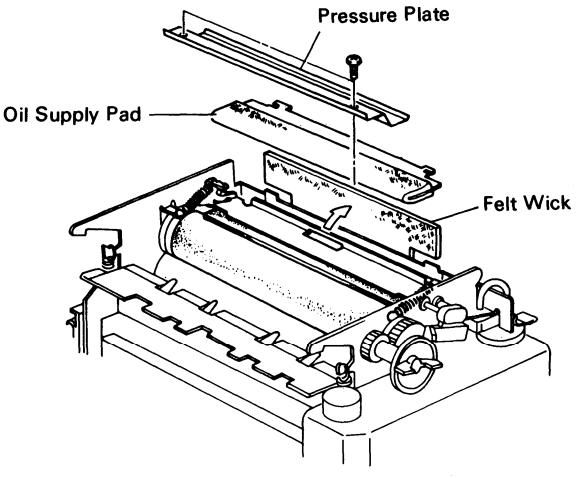
NOTE: The cleaning pad is reversable. However, do not use the other side if it is too oily.



6F-3. Oil Supply Pad Replacement

1. Remove the fusing unit cover (2 screws).
2. Remove the pressure plate (2 screws).
3. Remove the oil supply pad.
4) Install a new oil supply pad.

NOTE: * Make sure that flathead side is up.
* When reassembling, use non-tapping screws to secure the pressure plate.



6F-4. Oil Blade Replacement

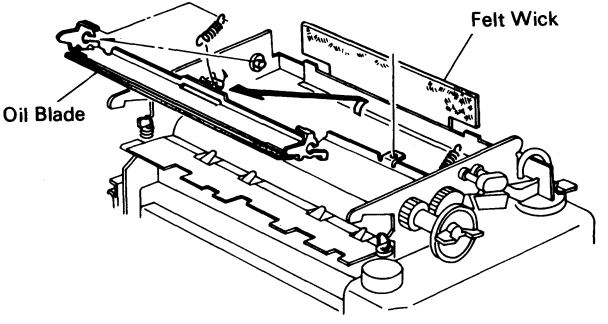
1. Remove the oil supply pad (See 6F-3).
2. Unhook the two springs and take out the oil blade.
3. Loosen the three blade holder screws and take out the blade.
4. Insert a new oil blade under the blade holder.

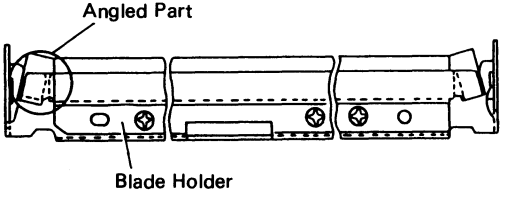
NOTE: The marked side of the blade should face the screw-head side.

5. Fit the blade to the shape of the holder and tighten the screws.

NOTE: * It is best to tighten the center screw first, then fit the ends to the angled parts of the holder and tighten the end screws.
* Use short screws (M4 x 6) to secure the blade holder.

6. Prime the edge of the blade with silicone oil and reassemble.

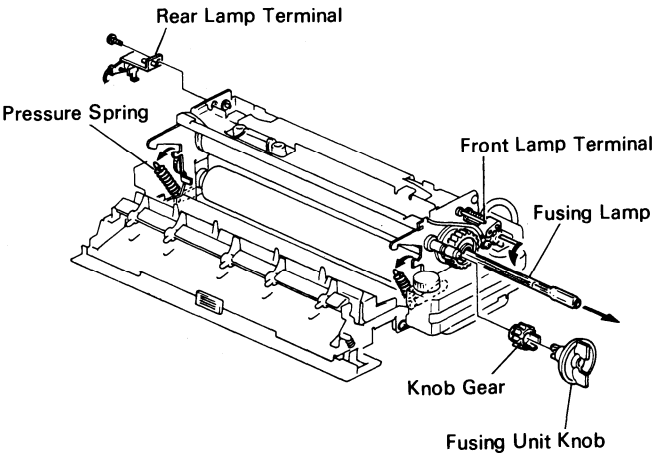




6F-5. Hot Roller Replacement

CAUTION: When replacing the hot roller, be careful not to damage the thermistor.

1. Remove the fusing unit (See 6F-1).
2. Remove the oil blade (See 6F-4).
3. Take off the fusing unit knob and knob gear.
4. Pull and rotate the front lamp terminal, and take out the fusing lamp.
5. Take off the rear lamp terminal (1 screw).
6. Unhook the pressure springs.



7. Remove the gears, bearings, and bushings from both ends (1 C-ring each).

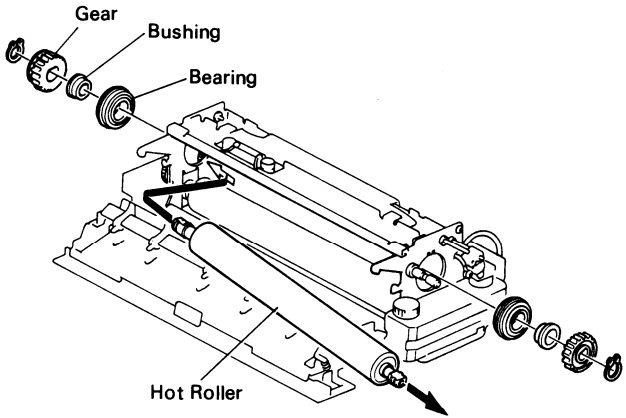
8. Slide the hot roller slightly to the rear and take it out through the exit assembly opening.

9. Tear the protective paper from the ends of a new hot roller and install it carefully.

10. After the hot roller is set, tear off the protective paper.

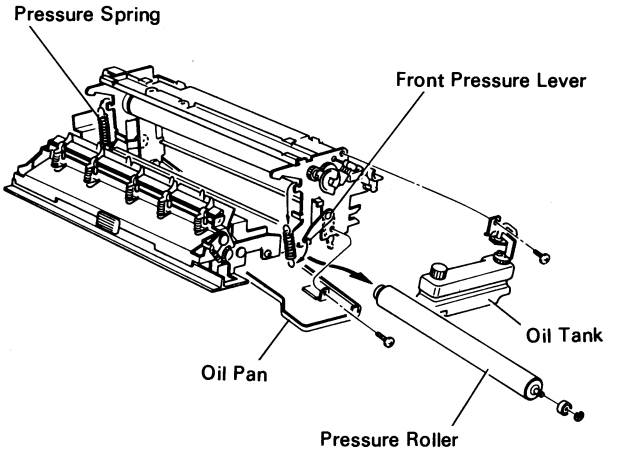
11. Reassemble the fusing unit.

NOTE: Apply extra silicone oil to the oil blade to avoid excess friction between it and the new hot roller.
Confirm that the fusing lamp does not contact the inside of the hot roller by turning the hot roller.



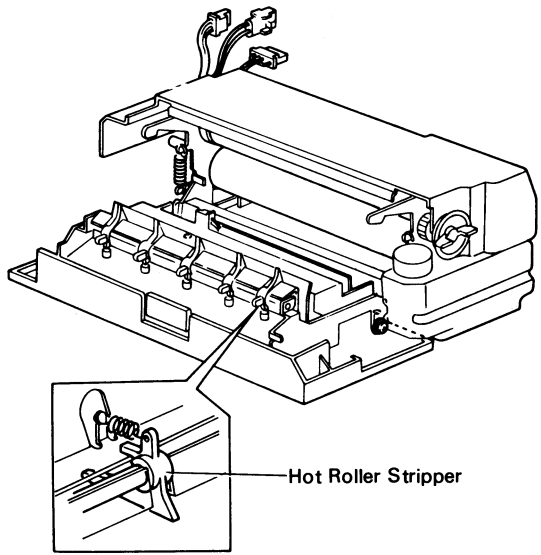
6F-6. Pressure Roller Replacement

1. Remove the fusing unit (See 6F-1).
2. Take off the fusing unit cover (2 screws).
3. Remove the cleaning pad (2 screws).
4. Take off the oil tank (1 screw).
5. Unhook the pressure springs.
6. Remove the front pressure lever (1 E-ring).
7. Remove the oil pan screw.
8. Lift up the upper part of the fusing unit and take out the pressure roller.
9. Install the bearings on a new roller's shaft.
10. Install the new pressure roller and reassemble.



6F-7. Hot Roller Stripper Replacement

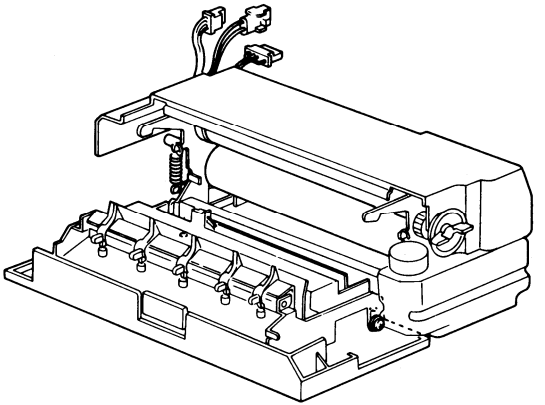
1. Pull out the fusing unit and open the exit assembly.
2. Unhook the springs and take off the hot roller strippers.
3. Snap on new strippers and connect the springs.

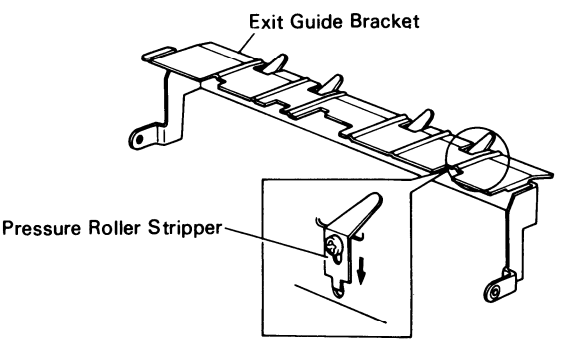


6F-8. Pressure Roller Stripper Replacement

CAUTION: Be careful not to bend or deform the pressure roller strippers when installing.

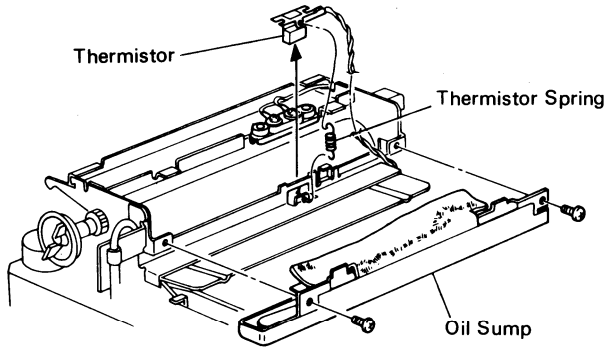
1. Pull out the fusing unit and open the exit assembly.
2. Take out the lower exit guide bracket (1 screw).
3. Replace the pressure roller strippers.
   Pull each stripper down against the guide bracket before tightening its screw.

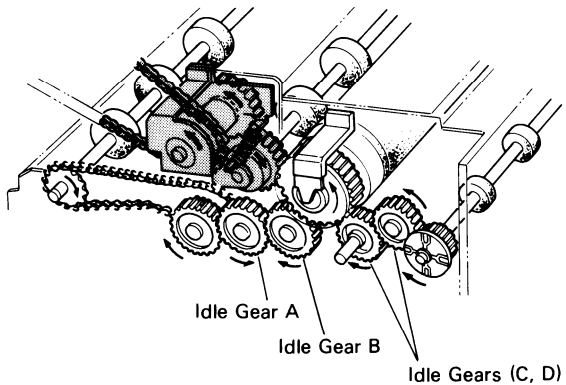




6F-9. Thermistor Replacement

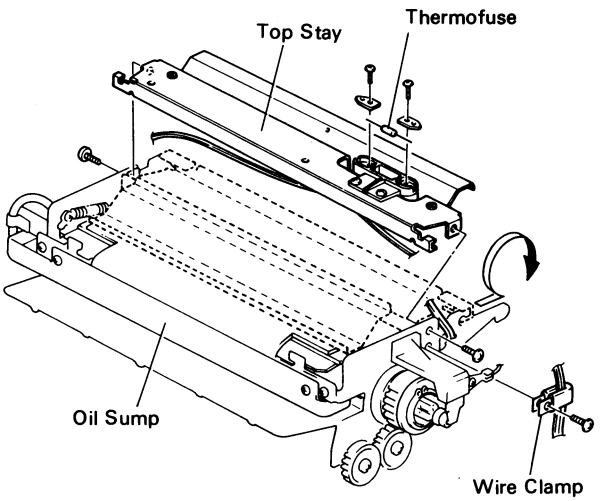
1. Remove the fusing unit (See 6F-1).
2. Remove the oil blade (See 6F-4).
3. Take off the oil sump (2 screws).
4. Remove an idle gear A (1 E-ring).
5. Unhook the thermistor spring and remove the thermistor (1 wire clamp).





6F-10. Thermofuse Replacement

1. Lower the exit assembly and take off the fusing unit cover (2 screws).
2. Remove the wire clamp holding the lead wires of the thermofuse and the fusing lamp.
3. Take out the two screws holding the top stay and turn it over.
4. Replace the thermofuse (2 screws).
5. Reassemble.

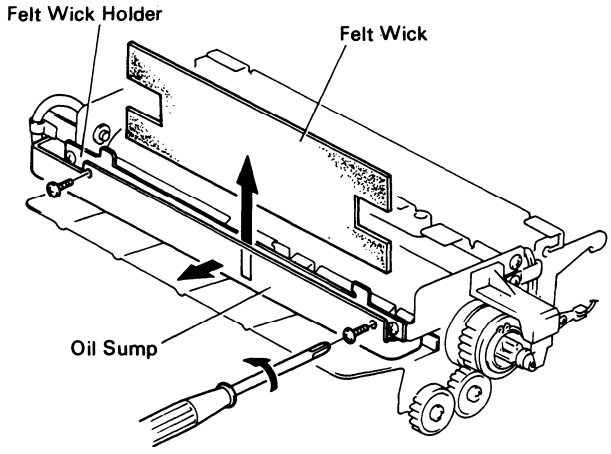


6F-11. Felt Wick Replacement

1. Remove the oil supply pad (See 6F-3).
2. Remove the oil sump from the felt wick holder (2 screws).
3. Take off the old felt wick.
4. Prime a new felt wick with silicone oil and install it.

NOTE: Make sure that the new wick touches the bottom of the oil sump.

5. Reassemble.



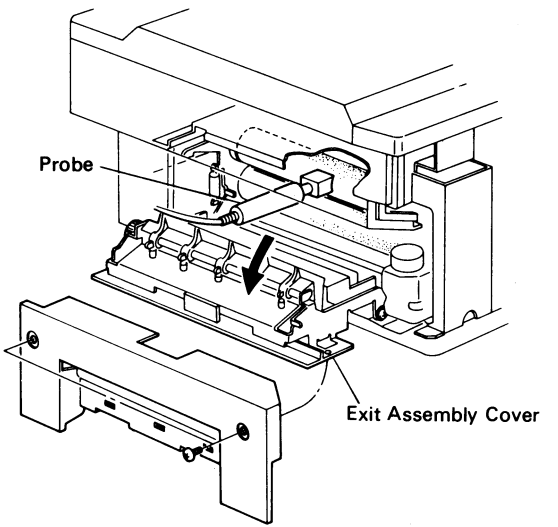
6F-12. Checking Hot Roller Temperature

1. Push the slide unit to the left.
2. Remove the exit assembly cover (2 screws).
3. Open the exit assembly and lower the exit quide plate.
4. Reset the slide unit.
5. Turn on the main switch and wait 10 minutes.
6. Press the probe of the digital surface thermometer against the middle of the hot roller.
7. After the probe has warmed up (about 30 sec.), read the temperature.
   * Lamp ON temperature: 185 ± 5°C (at normal setting)

NOTE: * With the DIP switches on the fusing control unit, the operating temperature can be raised or lowered about 5°C.

* If the temperature is too high, the thermistor may not be making good contact. Check thermistor contact, surface condition, etc.

* If the temperature is too low, either the thermister or the fusing control unit may be defective. Replace the defective part.



6F-13. Fusing Temperature Selection (DIP SW) and Fusing Control Unit Replacement

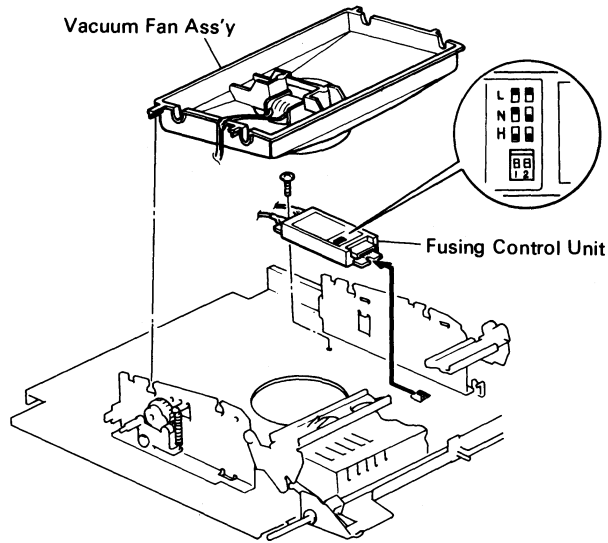
1. Follow Transport Roller Replacement (6E-3) steps 1 through 7.
2. Lift off the vacuum fan assembly.

* Temperature Selection :
With the two DIP swiches on the fusing control unit, select the desired fusing temperature according to the table on the right.

* Replacement :
Replace the fusing control unit (1 connector, 2 AC power lines, 1 screw).

Fusing Temperature

Selection \ DIP SW.		1	2
H	190°C	OFF	OFF
N	185°C	ON	OFF
L	180°C	ON	ON



6G. COPY IMAGE

6G-1. Horizontal Magnification Adjustment [FT3020] 6-62
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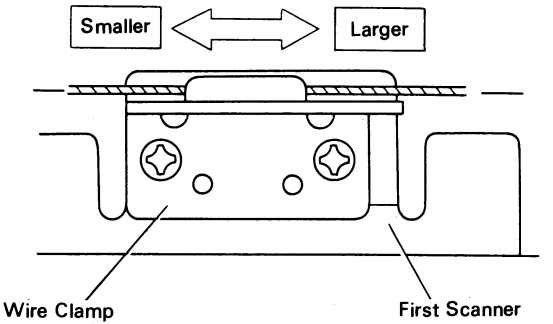
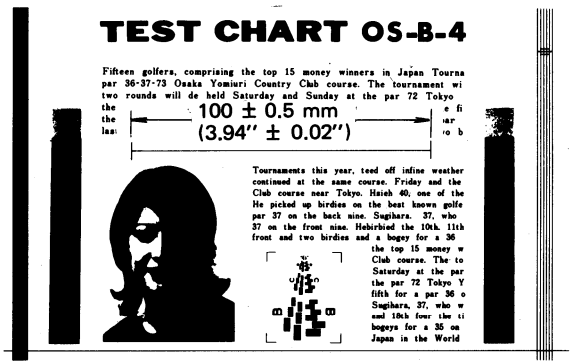
6G-7. Leading Edge Registration Adjustment [FT3060] 6-66-b

6G-1. Horizontal Magnification Adjustment [FT3020]

1. Remove the rear cover (2 screws).
2. Remove the top cover (8 screws).
3. Loosen the wire clamp screws.
4. Move the lamp right to enlarge the copy image. Move it left to make the image smaller.
   (as viewed from the rear side)
5. Tighten the wire clamp screws and check the horizontal magnification.

NOTE: This adjustment only effects horizontal magnification. Vertical magnification is controlled by the scanner speed.



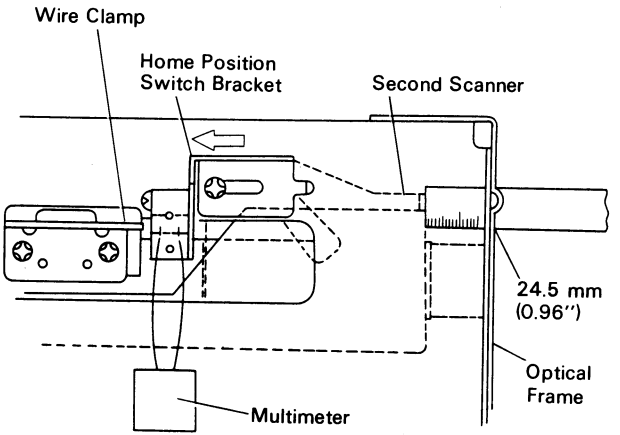


6G-2. Home Position Adjustment [FT3020]

NOTE: * After adjusting the horizontal magnification do this adjustment.

* Turn the main switch off before doing home position adjustment.

1. Move the scanner bracket 24.5mm (0.96") from the outside of the left optical frame.
2. Uncouple the home position switch connector.
3. Connect the multimeter lead clips to the home position switch and select OHM range.
4. Move the home position switch bracket from the right to the left just to the point where the multimeter goes to ∞ Ω.
5. Secure the home position switch bracket.



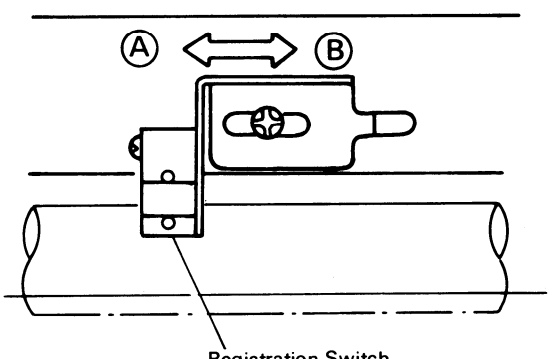
6G-3. Leading Edge Registration Adjustment

* Adjustment Standard: –2 ± 2 mm
  (0.08 ± 0.08")

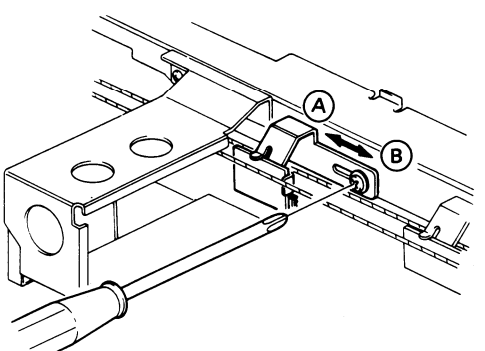
Leading edge registration is adjusted by changing registration switch position.

Ⓐ : Delay Paper Feed

Ⓑ : Speed Up Paper Feed



[FT3020]



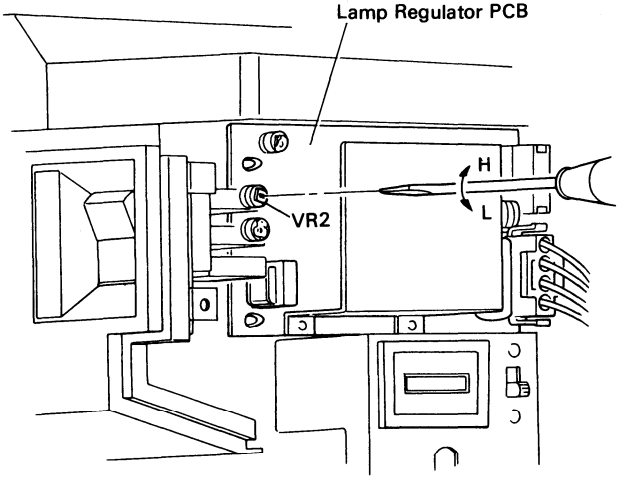
[FT3050]

6G-4. Light Intensity Adjustment

* Adjustment Standard: Level 2 of the gray scale should be just barely visible on the copy.

1. Clean the optics. (Mirrors, Lens, Reflectors, Exposure Glass, Toner Shield Glass)
2. Turn on the main switch and set the image density level at position number 3.

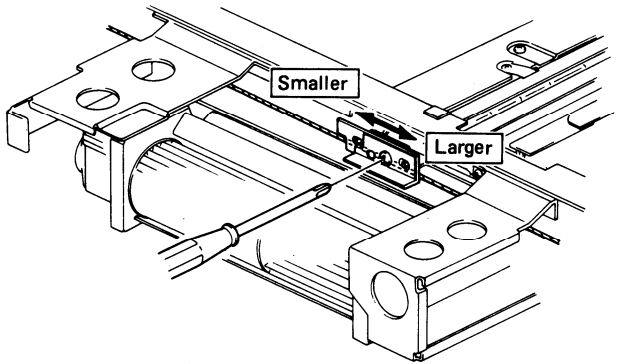
3. Make copies of the OS-B-4 test chart and compare the copy image with the adjustment standard.
   If the light intensity is not proper, do the following.
4. Open the front cover and remove the inner cover (4 screws). [FT3020]
   Open the front cover, push the slide unit to the left, and remove the inner cover (5 screws). [FT3050]
5. Adjust VR2 on the Lamp Regulator PCB to achieve proper copies.

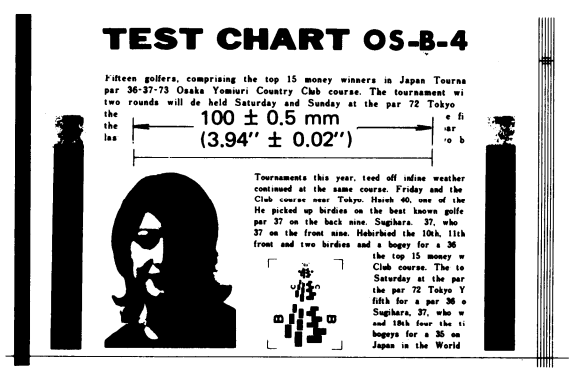


6G-5. Horizontal Magnification Adjustment [FT3050/FT3060]

1. Remove the rear cover (2 screws).
2. Remove the top cover (8 screws).
3. Loosen the wire clamp screws.
4. Move the lamp right to enlarge the copy image. Move it left to make the image smaller.
   (as viewed from the rear side)
5. Tighten the wire clamp screw and check the horizontal magnification in full size mode.

NOTE: This adjustment only effects horizontal magnification. Vertical magnification is controlled by the scanner speed.



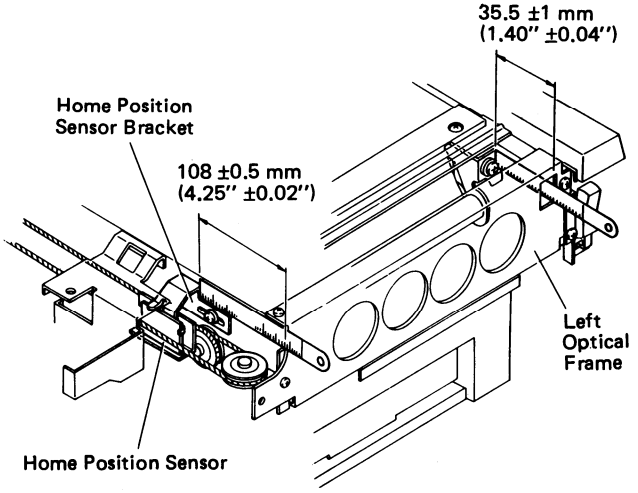


6G-6. Home Position Adjustment [FT3050/ FT3060]

NOTE: * After adjusting the horizontal magnification do this adjustment.

* Turn the main switch off before doing home position adjustment.

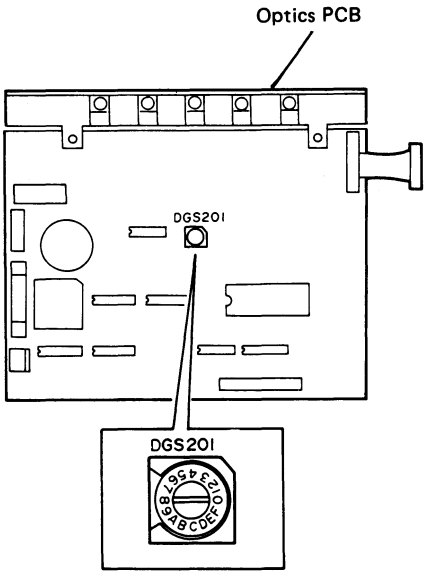
1. Remove the platencover and the platen cover mounting studs.
2. Remove the top cover (8 screws).
3. Remove the left cover (3 screws).
4. Secure the home position sensor bracket temporarily 108 ± 0.5 mm (4.25" ± 0.02") from the inside edge of the left optical frame (See illustration).
5. Turn on the main switch and wait for warm up.
6. After warm up, check the distance between the second scanner and the outside of the left optical frame.
   The distance should be 35.5 ± 1 mm (1.40" ± 0.04").
7. By turning on/off the main switch, check the distance several times.
   Readjust the position of the home position sensor bracket as necessary.



6G-7. Leading Edge Registration Adjustment [FT3060]

* Adjustment Standard: –2 ± 2 mm
(0.08 ± 0.08")

Leading edge registration is adjusted by changing the dial setting of DGS201 on the optics PCB.



Dial Settings	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Leading Edge Registration	+ ← 1.0 mm / Step → –															

6H. OTHERS

6H-1. Corona Wire Replacement

I. Charge Corona Wire 6-68

II. T/S Corona Wires 6-70

6H-2. Drum Current Adjustment

[Preparation] 6-71

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[Transfer and Separation Coronas] 6-75

6H-3. Belt Tension Adjustment 6-77

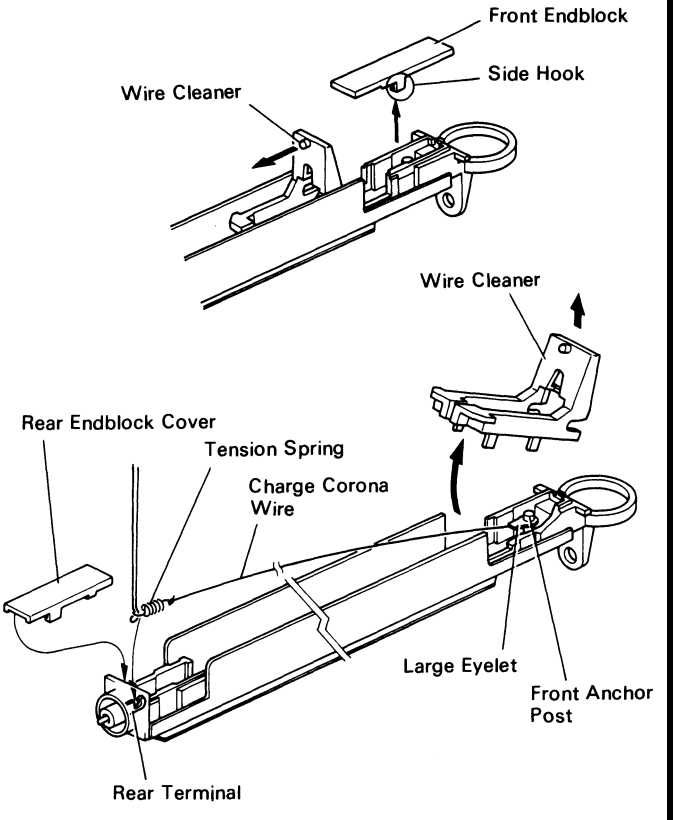
6H-4. Tension Spring Position 6-79

6H-1. Corona Wire Replacements

I. Charge Corona Wire

CAUTION:
* Do not handle the new corona wire with your bare hands. Oil on the wire will cause uneven charge on the drum.
* Do not rub the corona wires with rough material (sandpaper etc.) because the corona wires are carbon coated.
* When removing the endblock covers, be careful not break off the side hooks.

1. Slide the wire cleaner away from the front endblock as shown.
2. Remove the front and rear endblock covers.
3. Slide the wire cleaner back to the front end and remove it.
4. Unhook the spring and take off the old corona wire.



5. Hook the large eyelet of the new corona wire to the front anchor post.

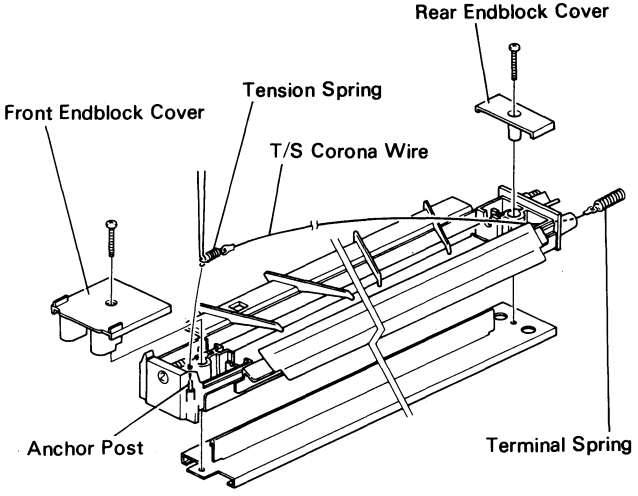
6. Hook the tension spring to the small eyelet and then hook it to the rear terminal.

7. Reassemble the charge corona unit.

NOTE: Make sure that the corona wire is positioned between the cleaner pads.

II. T/S Corona Wires

1. Remove the front and rear endblock covers (1 screw each).
2. Unhook the spring from the front endblock terminal and take off the old corona wire.
3. Insert one eyelet of the new corona wire through the hole of the rear endblock and hook it to the terminal spring.
4. Hook the tension spring to the other end and then hook it to the front endblock anchor post.
5. Reset the endblock covers.



6H-2. Drum Current Adjustment

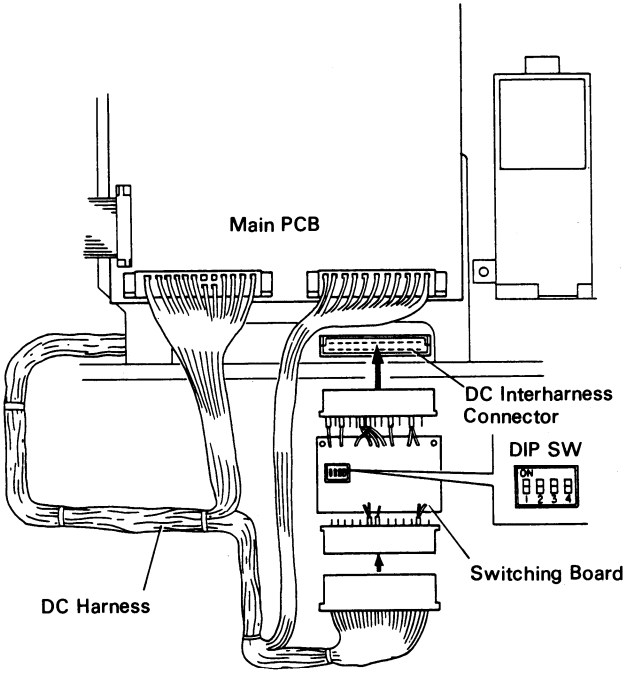
CAUTION: Make sure the main switch is off when you change the range of digital multimeter.
If it is not, the multimeter may be damaged.

NOTE: Though the symbol "U1" is displayed in the copy counter when the main switch is on, drum currents can be adjusted.

[Preparation]

1. Remove the rear cover (2 screws).
2. Remove the optics PCB (1 screw, 4 connectors). [FT3050/FT3060]
3. Uncouple the DC interharness connector.
4. Insert the switching board between the DC interharness connectors (See illustration). (The illustration for FT3050/FT3060 is shown on the next page.)

CAUTION: All the DIP SW's on the switching board should be off.



[FT3020]

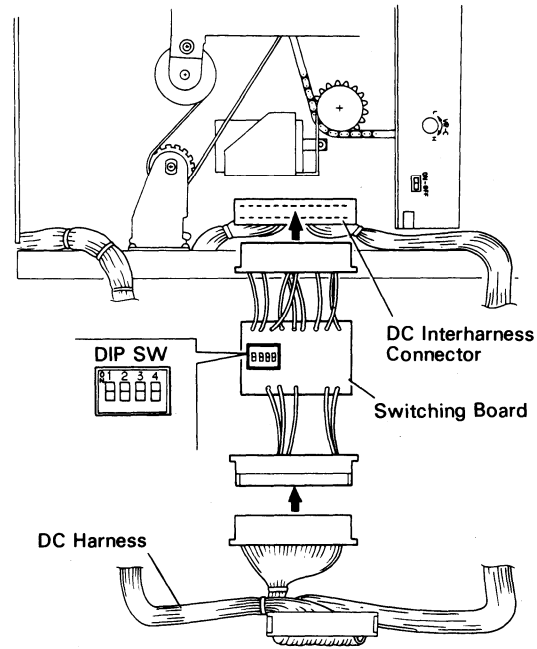
5. Remove the following parts (Front Side):
   * Toner Collection Bottle
   * Charge Corona Unit
   * Drum Stay
   * Development Unit
   * Cleaning Unit
   * Erase Lamp Unit
   * Drum Flange, Drum, and Drum Guide

6. Slide the drum shoe with the shoe adapter on the drum shaft.

7. Route the shoe lead wire out through the development unit opening and reset the drum stay.

8. Reset the charge corona unit.

9. Connect the digital multimeter leads – the positive to the red shoe lead clip, and the negative and the black shoe lead clip to ground (See next page).

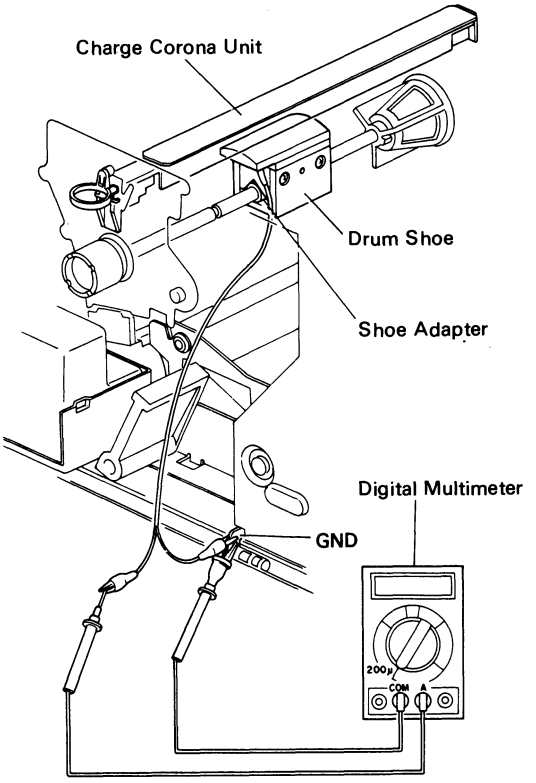


[FT3050/FT3060]

[Charge Corona]

*** Adjustment Standard: DC + 14.6 $^{+0.06}_{-0.47}$ μA**

1. Slide the drum shoe to the middle of the drum shaft.
2. Position the drum shoe so that the current sensing plate faces up vertically.
3. Select the DC μA range of the digital multimeter.
4. Turn on DIP SW #3 on the switching board.
5. Turn off the charge compensation switch on the C/B power pack (See next page).
6. Turn on the main switch and note the reading.

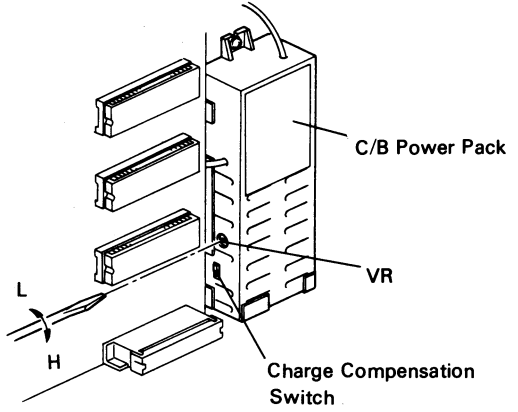


7. Adjust the charge corona current by turning the VR on the C/B power pack.

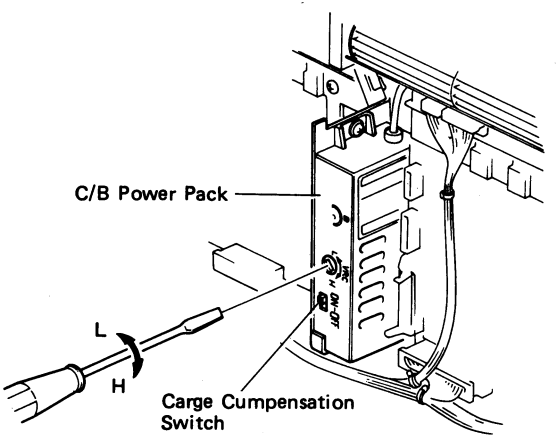
NOTE: Wait 20 seconds for the current to stabilize.

8. Turn off the main switch and DIP SW #3.

9. Turn on the charge compensation switch.



[FT3020]



[FT3050/FT3060]

[Transfer and Separation Coronas]

* Adjustment Standards:
  Transfer Corona; DC +15.2 ± 0.6μA
  Separation Corona; AC 25.1 ± 1.5μA
  DC $-0.6^{+0.25}_{-0.6}$ μA

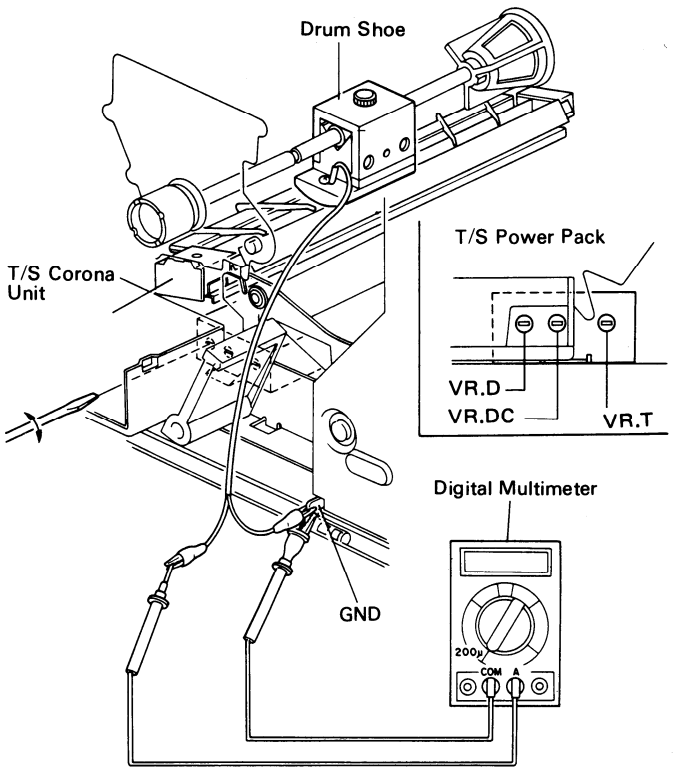
1. Position the drum shoe so that the current sensing plate faces down vertically.

NOTE: Measure both the transfer and separation currents with the shoe at the same position.

2. Select the DC μA range of the digital multimeter, and turn on DIP SW #2 on the switching board.

3. Turn on the main switch and adjust the transfer corona current by turning "VR.T" on the T/S power pack.

NOTE: Wait 20 seconds for the corona current to stabilize.



4. Turn off the main switch and then turn off DIP SW #2 on the switching board.
5. Turn on DIP SW #1 on the switching board.
6. Turn on the main switch and adjust the separation corona DC current by turning “VR.DC” on the T/S power pack.
7. Turn off the main switch and then select the AC µA range of the digital multimeter.
8. Turn on the main switch and adjust the separation AC current with “VR.D” on the T/S power pack.
9. Turn off the main switch and select the DC µA range of the digital multimeter.
10. Turn on the main switch and check the separation DC current again.

6H-3. Belt Tension Adjustment

Press the timing belt with a tension gauge as shown in the figure and adjust the tension by repositioning the tension pulley bracket.

* Adjustment Standard:

Development unit Drive Belt;

0.17~0.25 kg (2.1 mm)

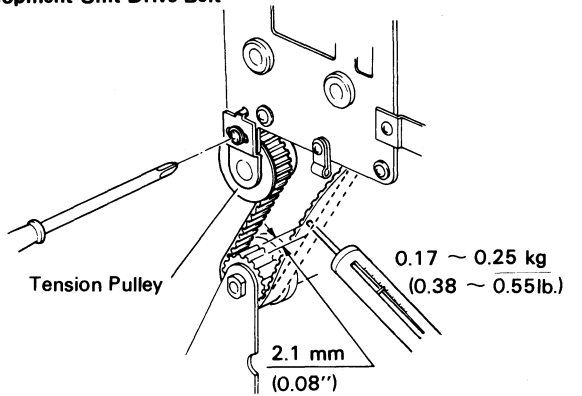
(0.38~0.55 lb. (0.08"))

Scanner Drive Belt; [FT3020]

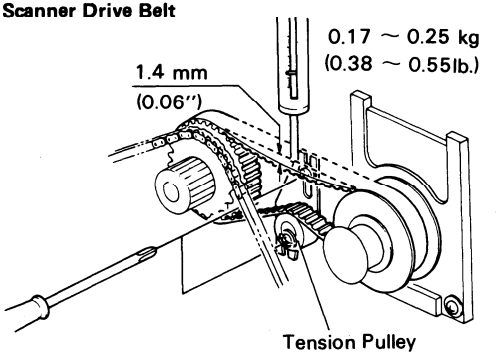
0.17~0.25 kg (1.4 mm)

(0.38~0.55 lb. (0.06"))

Development Unit Drive Belt



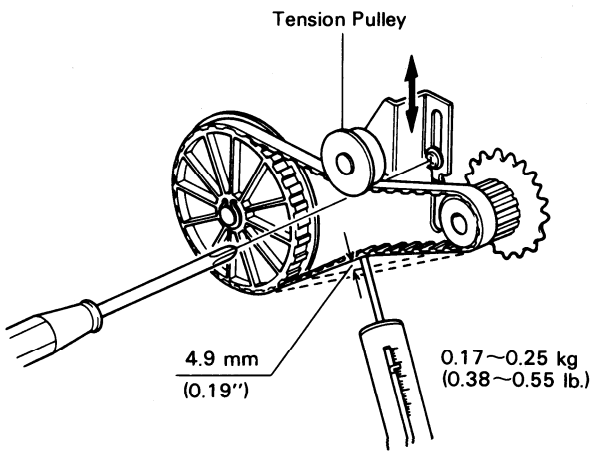
Scanner Drive Belt



[FT3020]

* Adjustment Standard:
  Drum Drive Belt; [FT3050/FT3060]
  0.17~0.25 kg (4.9 mm)
  0.38~0.55 lb. (0.19")

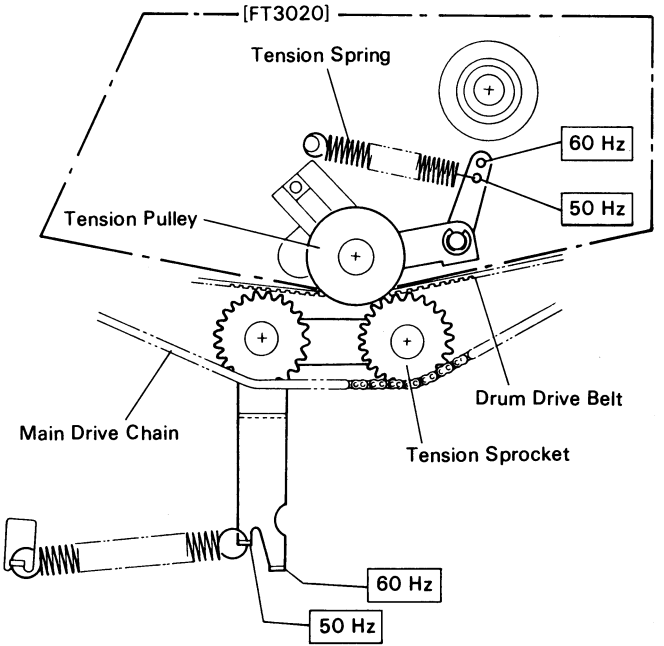
Drum Drive Belt



[FT3050/FT3060]

6H-4. Tension Spring Position

The tension springs must be positioned differently depending on the local AC cycle frequency. Make sure that the tension springs are hooked to the proper position as shown in the figure.



SECTION 7

SERVICE TABLES

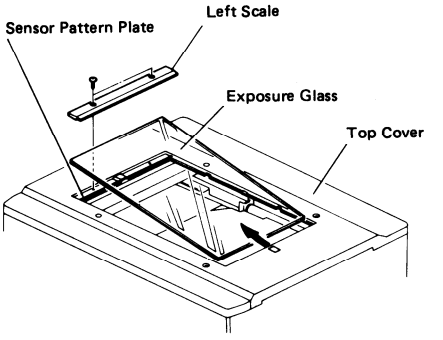
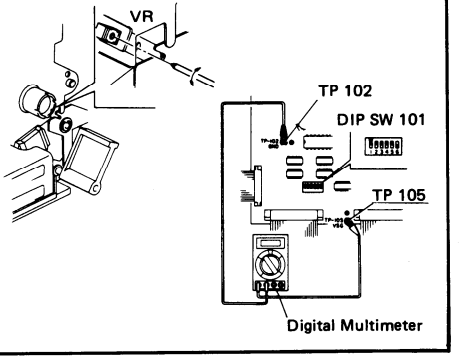
7. SERVICE TABLES

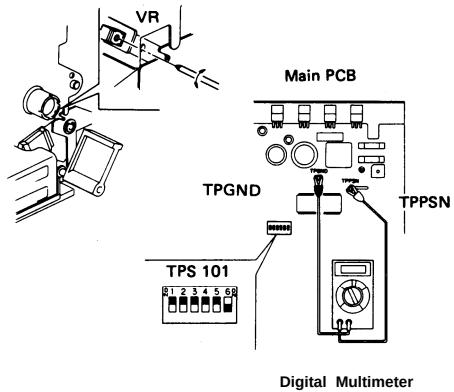
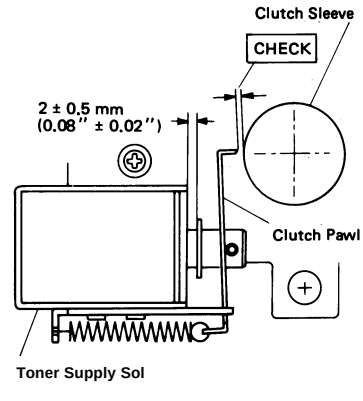
7A. Table of Adjustments 7-1

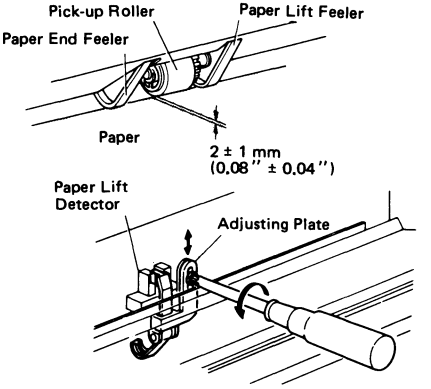
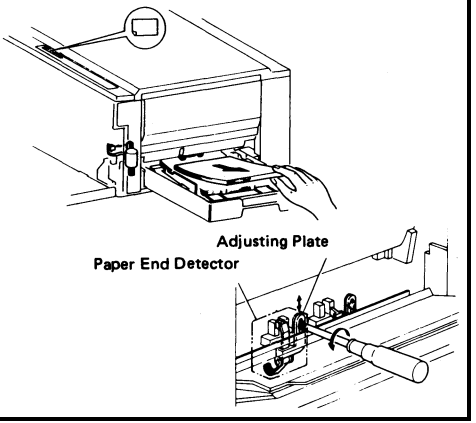
7B. DIP SW Tables 7-11

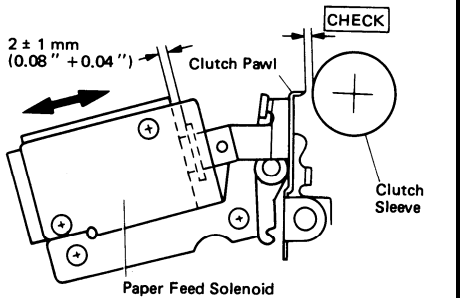
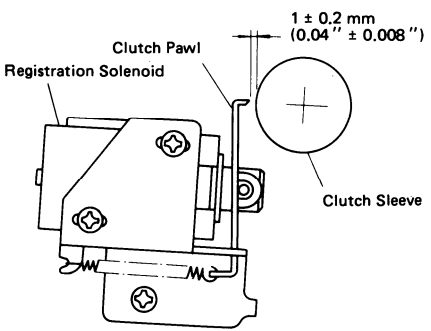
7C. Service Call Conditions 7-14

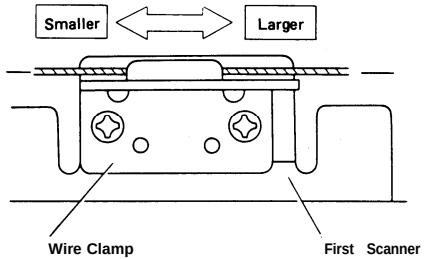
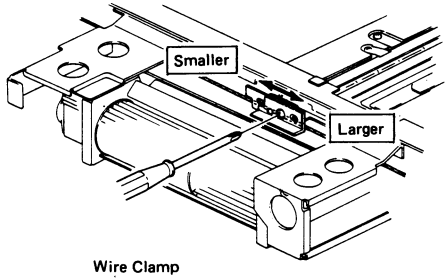
7A. Table of Adjustments

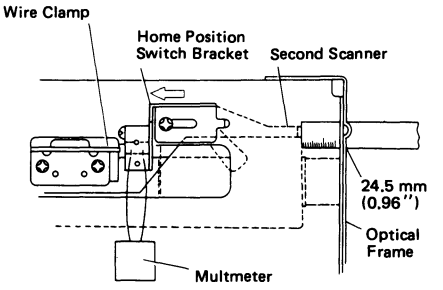
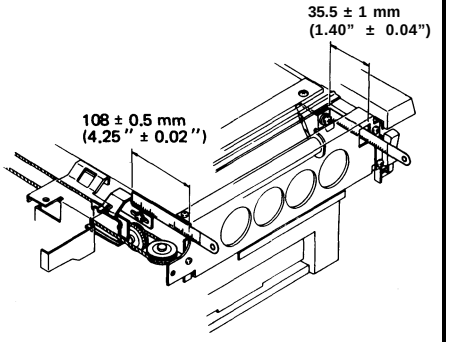
No.	Adjustment Item	Adjustment Standard	Note
1	Left Scale	1) Make sure the exposure glass is flush with the sensor pattern plate. 2) The left scale must overlap the exposure glass by 10 ± 0.5mm (0.39" ± 0.02"). [FT3020]	
2	Image Density Sensor [FT3020]	+3 ± 0.2V	

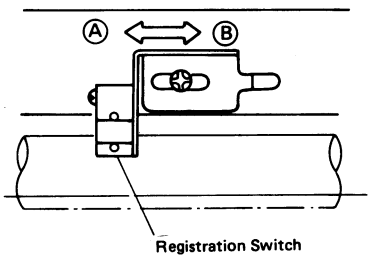
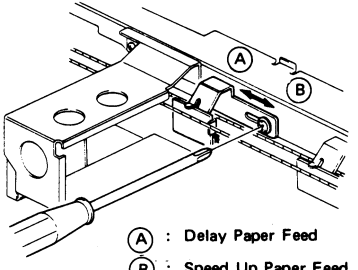
No.	Adjustment Item	Adjustment Standard	Note
3	Image Density Sensor [FT3050/FT3060]	+4 ± 0.2V	
4	Toner Supply Solenoid	Stroke : 2 ± 0.5 mm (0.08" ± 0.02")	

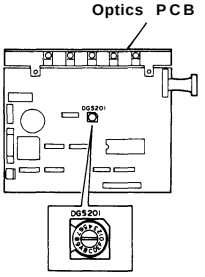
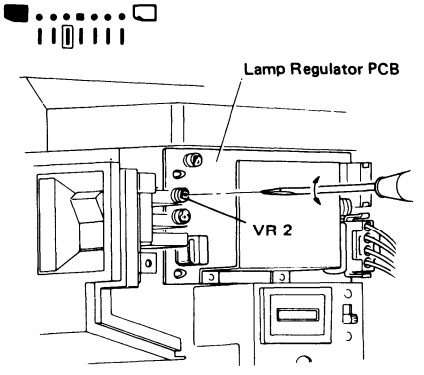
No.	Adjustment Item	Adjustment Standard	Note
5	Paper Lift Detector	Clearance between pick-up roller and paper ; 2 ± 1 mm (0.08" ± 0.04")	
6	Paper End Detector	Thickness of the stack of removed paper ; 3 ± 1 mm (0.12" ± 0.04")	

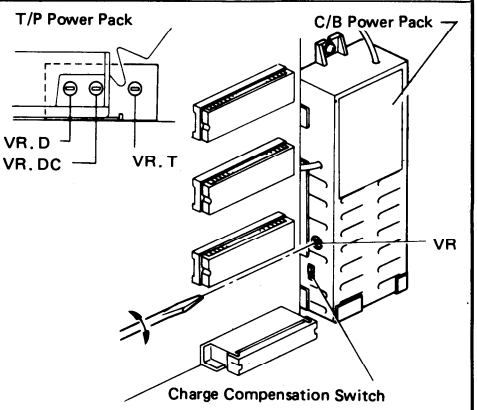
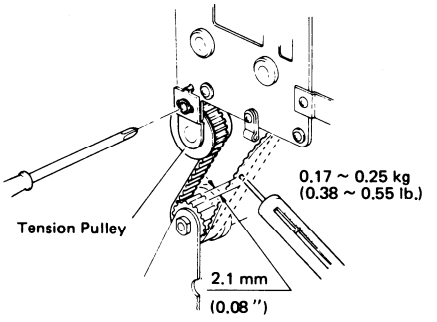
No.	Adjustment Item	Adjustment Standard	Note
7	Paper Feed Solenoid	Stroke ; $2\ ^{+1}_{0}$ mm $(0.08''\ ^{+0.04''}_{0''})$	
8	Registration Solenoid	Gap : 1 ± 0.2mm (0.04" ± 0.008")	

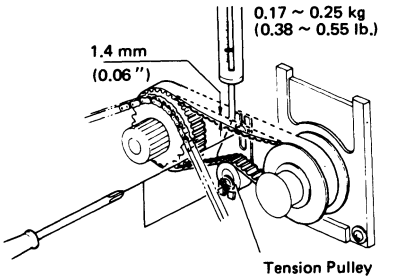
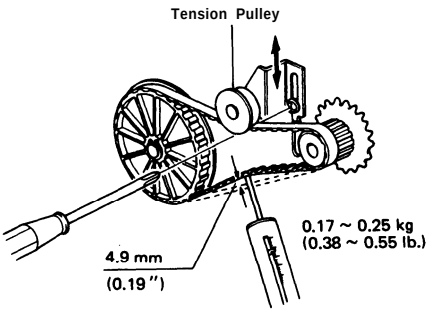
No.	Adjustment Item	Adjustment Standard	Note
9	Horizontal Magnification [FT3020]	± 0.5%	
10	Horizontal Magnification [FT3050/ FT3060]	± 0.5% (Full Size)	

No.	Adjustment Item	Adjustment Standard	Note
11	Home Position [FT3020]	Home Position Switch turns on when the scanner bracket is 24.5 mm (0.96") from the outside of the left optical frame.	
12	Home Position [FT3050/FT3060]	Home Position Sensor Bracket ; 108 ± 0.5 mm (4.25" ± 0.02") Distance between the Second Scanner and the Left Optical Frame : 35.5 ± 1 mm (1.40" ± 0.04")	

No.	Adjustment Item	Adjustment Standard	Note
13	Leading Edge Registration [FT3020]	-2 ± 2 mm (-0.08" ± 0.08")	 Ⓐ : Delay Paper Feed Ⓑ : Speed Up Paper Feed
14	Leading Edge Registration [FT3050]	-2 ± 2 mm (-0.08" ± 0.08")	 Ⓐ : Delay Paper Feed Ⓑ : Speed Up Paper Feed

No.	Adjustment Item	Adjustment Standard	Note
15	Leading Edge Registration [FT3060]	-2 ± 2 mm (-0.08" ± 0.08")	Dial Settings: 0 1 2 3 4 5 6 7 8 9 A B C D E F Leading Edge Registration: + ← → - 1.0 mm/Step 
16	Light Intensity	Level 2 of the gray scale should be just barely visable on the copy (ID level 3).	

No.	Adjustment Item	Adjustment Standard	Note
17	Drum Current	Charge Corona ; DC +14.6 $^{+0.06}_{-0.47}$ μA Transfer Corona ; DC +15.2 $\pm$ 0.6 μA Separation Corona ; AC 25.1 $\pm$ 1.5 μA DC –0.6 $^{+0.25}_{-0.6}$ μA	
18	Dévelopment Unit Drive Belt Tension	0.17 ~ 0.25 kg (2.1 mm) (0.38 ~ 0.55 lb. (0.08"))	

No.	Adjustment Item	Adjustment Standard	Note
19	Scanner Drive Belt Tension	0.17 ~ 0.25 kg (1.4 mm) (0.38 ~ 0.55 lb. (0.06"))	
20	Drum Drive Belt	0.17 ~ 0.25 kg (4.9 mm) (0.38 ~ 0.55 lb. (0.19"))	

7B. DIP SW Table

I. Usage of DIP SW 101 (on the main PCB)

DIP SW 101

No.	ON	OFF
1	Free Run	Normal Operation
2	Count Down	Count Up
6	I/D Sensor LED ON	Normal Operation

(Toner Supply Control)

3	ON (Fixed Mode)				OFF (Detect Mode)			
4	OFF	ON	OFF	ON	OFF	ON	OFF	ON
5	OFF	OFF	ON	ON	OFF	OFF	ON	ON
	0%	3.5%	7%	10.5%	0%	10%	20%	30%

NOTE: *Free Run (after warm up.)

The following functions are by-passed in this mode.

- Paper End
- Toner End
- Paper Feed
- Jam Check
- Total Counter
- Key Counter
- Interrupt
- Image Density Keys
- Copy Quantity Keys

II. Usage of DIP SW 201 (on the optics PCB) [FT3050/FT3060]

NO.	ON	OFF
1	Normal Operation	Scanner Free Run
2 (FT3050 only)	Not Used	

III. Usage of DGS201 (on the optics PCB) [FT3060]

Dial Settings	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Leading Edge Registration	+ ← 1.0 mm/Step → −															

IV. Fusing Temperature Selection SW (on the fusing control unit)

DIP SW. / Selection	1	2
H 190°C	OFF	OFF
N 185°C	ON	OFF
L 180°C	ON	ON

7C. Service Call Conditions

INDICATOR	POSSIBLE CAUSE	CHECK POINT
U1 (Close Door)	Main Board Failure	24V is applied to CN103-1A
	Harness or Connector (24VDC) Failure	24V is not applied to CN103-1A
	Thermofuse Failure	24V is not applied to CN82-6
U2 (Set Key Counter)	Key Counter Failure	While Key Counter is set, CN79-1, 2 = ∞Ω
	Main Board Failure	0V is applied to CN103-10B
	Harness or Connector Failure	0V is not applied to CN103-10B
U3 Add Silicone Oil and/or Replace Toner Collection Bottle	Oil End Sensor Failure	CH103-8B is 0V when the oil end sensor is soaked in oil.
	Toner Overflow Sensor Failure	CH103-8B is 0V when the toner overflow sensor is out of toner.
	Main Board Failure	CH103-8B is 5V when the oil end sensor is soaked in oil and the toner overflow sensor is out of toner.

INDICATOR	POSSIBLE CAUSE	CHECK POINT
E1 (Exposure, Optics)	Exposure Lamp Failure	E1 is displayed immediately after turning on the Main SW.
	Lamp Regulator Failure	Scanner moves normally
	Main Board Failure (The Scanner Drive Clutch or Scanner Drive Motor on signal is not applied.)	Scanner does not move
	Scanner Drive Clutch-Forward Failure (FT3020)	
	Scanner Drive Motor Failure (FT3050/FT3060)	
	Optics Board Failure (FT3050/FT3060)	
	Home Position SW Failure **(Normally ON = ∞Ω, OFF = 0Ω)**	Scanner moves abnormally
	Registration SW Failure (FT3020/FT3050) **(Normally ON = ∞Ω, OFF = 0Ω)**	
	Overrun SWs Failure (FT3050) **(Normally ON = ∞Ω, OFF = 0Ω)**	

INDICATOR	POSSIBLE CAUSE	CHECK POINT
E1 (Exposure, Optics)	Scanner Drive Clutch – Return Failure ((FT3020)	Scanner moves abnormally
	Scanner Drive Clutch Slippage (FT3020)	
	Scanner Load is too heavy	
	Lens HP Sensor Failure (FT3050/FT3060)	When the lens is at the home position, 0V is still applied to CN202-9.
E2 (Functional Drive)	Pulse Generator Failure (Pulse Signal is not produced)	Pulse Generator rotates
	Harness or Connector Failure (Pulse Signal is not applied to Main Board)	
	Main Board Failure	
	Main Motor Failure	Outlet Cooling Fan rotates
	RA2 Failure	Outlet Cooling Fan does not rotate
	RA1 and/or Safety SW Failure (If failure occurs after warm-up.)	Exhaust Fan does not rotate

INDICATOR	POSSIBLE CAUSE	CHECK POINT
E3 (Fusing Abnormal)	Thermistor Failure (∞ Ω)	E3 is displayed soon after turning on the Main SW.
	Fusing Control Unit Failure	Fusing Lamp on signal is applied to CN103-7B more than 130 sec.
	Fusing Lamp open	
	Main Board Failure	Abnormal signal is applied
	Thermistor Failure (0 Ω)	
	RA1 and/or Safety SW Failure (Warm up)	Exhaust Fan does not rotate
E4 (Total Counter Abnormal)	Total Counter Failure	CN103-9A does not drop to 0V
	Main Board Failure	CN103-9A drops from 26V to 0V

SECTION 8

P.M. TABLE

8. P.M. TABLE

o : Clean * : Replace # : Lubricata

ITEM	EM	40K	80K	120K	160K	200K	240K	NOTE
OPTICS								
1. Mirrors, Lens, Reflectors, Sensor Pattern	o	o	o	o	o	o	o	Alcohol or Water (Si. Cloth)
2. Exposure Glass, Toner Shield Glass	o	o	o	o	o	o	o	Glass Cleaner and Dry Cloth
3. Platen Cover	o	o	o	o	o	o	o	Alcohol or Water
4. Exposure Lamp				*			*	
5. Scanner Guide Rod and Plate			#		o #		#	Launa Oil or Equivalent Oil
6. Lens Drive Shaft [FT3050/FT3060]						#		Launa Oil or Equivalent Oil
PAPER FEED								
7. Paper Feed Roller	o	*	*	*	*	*	*	Water
8. Pick-up Roller	o	*	*	*	*	*	*	Water
9. Separation Roller	o	*	*	*	*	*	*	Water
10. Slip Clutch			#		#		#	Mobil Temp 78
11. Paper Feed Clutch			#		#		#	Mobil Temp 78
12. Registration Roller			o		o		o	Water
13. Registration Clutch			#		#		#	Mobil Temp 78
14. Worm Gear & Worm Wheel		#	#	#	#	#	#	Launa Oil or Equivalent Oil
15. Cassette Pad			o		o		o	Water
16. Paper Feed Guide Plate		o	o	o	o	o	o	
CORONA UNITS								
17. Corona Wires	o	o	*	o	*	o	*	Wire Cleaner or Alcohol
18. Wire Cleaner			*		*		*	
19. End Blocks & Casing	o	o	o	o	o	o	o	Dry Cloth
DEVELOPMENT UNIT								
20. Developer			*		*		*	If Necessary
21. Development Unit Guide		o	o	o	o	o	o	

ITEM	EM	40K	80K	120K	160K	200K	240K	NOTE
CLEANING UNIT								Clean with Blower Brush
22. Cleaning Blade	o	*	*	*	*	*	*	Prime with Setting Powder
23. Cleaning Brush		*	*	*	*	*	*	Prime with Setting Powder
24. Cleaning Unit		o	o	o	o	o	o	
25. Pick-off Pawls	o	o	o	o	o	o	o	Replace if Necessary
FUSING UNIT								
26. Hot Roller		o	*	o	*	o	*	
27. Pressure Roller		o	o	*	o	o	*	If Necessary
28. Thermistor		o	o	o	o	o	o	
29. Stripper Pawls		o	*	o	*	o	*	At the same time
30. Oil Supply Pad		*	*	*	*	*	*	Prime with Oil when Replacing
31. Cleaning Pad		*	*	*	*	*	*	
32. Felt Wick		o	o	o	o	o	o	Replace if Necessary and Prime with Oil
33. Fusing Entrance & Exit Guide		o	o	o	o	o	o	Suitable Solvent
34. Oil Blade			*		*		*	Prime Blade Clean Oil Sump at the Same Time
OTHERS								
35. Toner Collection Bottle	○	○	○	○	○	○	○	Empty the Used Toner into
36. Transport Roller		○	○	○	○	○	○	Water
37. Exhaust Fan Filter		○	○	○	○	○	○	Water
38. ID Sensor	o	o	o	o	o	o	o	Blower Brush
39. Erase Lamp Unit		o	o	o	o	o	o	Blower Brush
40. Paper Feed Sensor	○	○	○	○	○	○	○	Blower Brush
41. Drive Chains			#		#		#	Spindle Oil
42. Bushings			#		#		#	Spindle Oil
43. Toner Supply Clutch			#		#		#	Mobil Temp 78
44. Quenching Lamp Filter	o	o	o	o	o	o	o	Water

NOTE:
- Empty the used toner from the toner collection bottle into a vinyl bag at every service call.
- At every EM, check and adjust the exposure light intensity.
- Check silicone oil level and add if necessary at every EM.
- To maintain the best copy quality the above scheduled items should be observed.
- The above items should be carried out either at an EM call or as copy quality indicates to be necessary.

SECTION 9

SPECIAL TOOLS AND JIGS

1. SPECIAL TOOLS AND JIGS

ITEM	DESCRIPTION	PART NO.
1.	Setting Powder	5442 9101
2.	Corona Current Measuring Shoe	5442 9106
3.	Shoe Adapter	5447 9104
4.	Switching Board	5447 9604
5.	Jump Wire-Corona Current	—
6.	Test Chart OS-B-4	5420 9503
7.	Digital Thermometer (HLC 60E)	5420 9504
8.	Digital Thermometer Probe (HLC 60E)	5420 9505
9.	Digital Multimeter (BECKMAN RMS3030)	5420 9507
10.	Deluxe Test Lead Accessory Kit (BECKMAN DL241)	5420 9508
11.	Tension Gauge	5419 9660
12.	Carpenter's Level	—
13.	Thickness Gauge	—

ITEM	DESCRIPTION	PART NO.
14.	Silicon Oil	5420 9550
15.	Launa Oil	5442 9103
16.	Grease (MOBIL TEMP 78) 400g	5447 9078
17.	Spindle Oil	—
18.	Isoprophil Alcohol	—
19.	Drum Cleaning Powder	5447 9605

TROUBLESHOOTING

This compilation is intended to help the field service engineer solve some of the more common field problems. However, it does not cover all potential problems, and it in no way replaces good field troubleshooting technique. Good field procedure and adequate machine knowledge must be developed and maintained by the service depot and the individual service engineer.

SECTION 10

TROUBLESHOOTING

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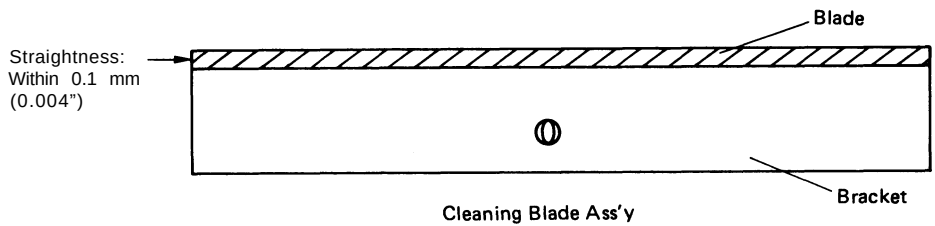
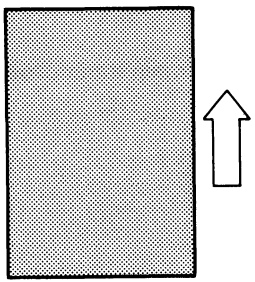
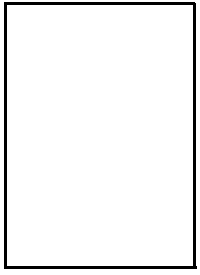
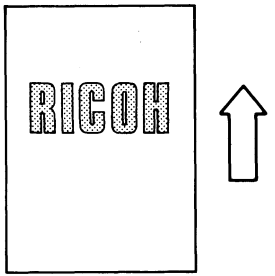
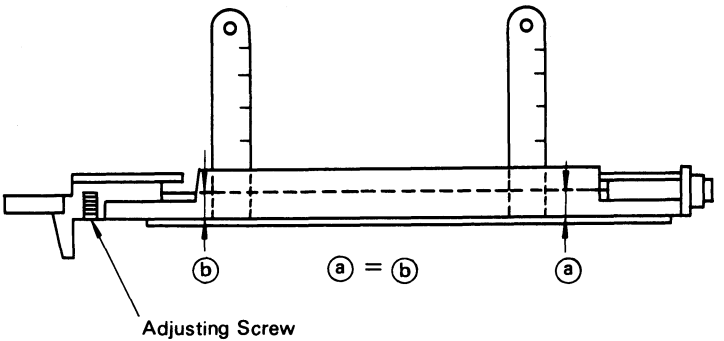
PHENOMENON	ACTION
Dirty background	1. Clean the optics, toner shield glass, and quenching lamp filter. 2. Check the pressure and release mechanism of the cleaning blade. 3. Check that cleaning brush turns correctly. 4. Clean the cleaning unit, and dust the cleaning blade, cleaning brush, and cleaning side seals with setting powder. 5. Check the straightness of the edge of the cleaning blade.  Cleaning Blade Ass'y

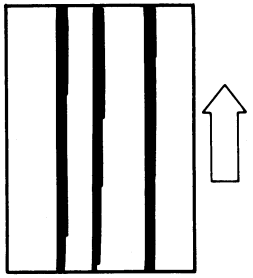
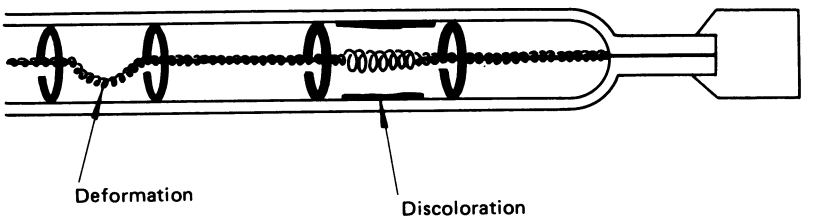
PHENOMENON	ACTION
Dirty background	6. Replace the cleaning blade assembly and/or the cleaning brush if necessary. **CAUTION:** Do not forget to dust them with setting powder. 7. Check the exposure lamp position. (See page 6-5.) 8. Adjust the lamp regulator output. (See page 6-65.) 9. Clean the I/D sensor if toner is being scattered inside the machine. 10. If the problem does not improve after doing the above, try changing the developer.

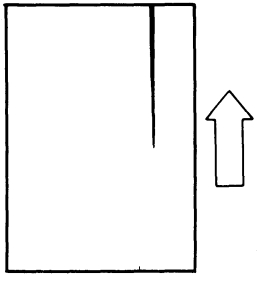
PHENOMENON	ACTION
Heavy background (No image or very light image) 	1. Clean the optics and toner shield glass. 2. Check and adjust the exposure lamp position. (See page 6-5.) 3. Check for paper wrapped around the drum. 4. Open the platen cover and press the Print Key. Observe the intensity of the exposure lamp. (Protect your eyes. Do not look directly at the lamp.) If exposure light is too weak, the lamp is too old or the lamp regulator output is incorrect. • Faulty lamp —> replace (See page 6-3.) • Faulty LR —> adjust or replace 5. Check that the drum drive belt is not off the pulley.

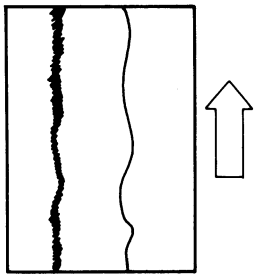
PHENOMENON	ACTION
White copy 	A totaly white copy may be the result of charge failure. 1. Check the charge corona unit contact. 2. Check the charge corona wire. 3. Check charge power pack input/output. 4. For the FT3050 and the FT3060, check the inner fuse of the main transformer. 5. Check the drum drive belt. (It may be off of the pulley.)

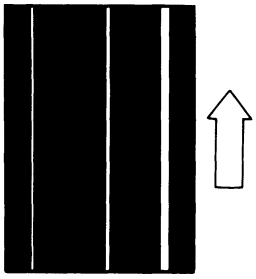
PHENOMENON	ACTION
Light image 	1. Check the color of the developer. If it is gray rather than black, insufficient toner is being supplied. 2. Clean the ID sensor. 3. Check toner supply clutch operation. 4. Check toner end detector operation. 5. Check the setting of DIP 101 switches 3, 4, and 5. (See page 7-11.) 6. Check development bias. 7. Make sure that the transfer corona wire is clean and unbroken and that the T/S corona unit is correctly set. 8. Check and adjust exposure lamp position. (See page 6-5.) 9. Replace the T/S corona unit end-blocks if they are cracked. 10. Adjust corona currents. (See page 6-71.)

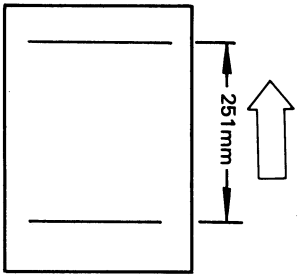
PHENOMENON	ACTION
Uneven image density (side to side)	1. Clean the optics. 2. If that does not work, adjust the exposure lamp position. (See page 6-5.) 3. Try to correct the image using the exposure adjusting plates. (See page 6-6.) 4. Check the charge wire height. It should be the same front and rear.  **NOTE:** After adjusting charge wire height, the charge corona current must be adjusted. (See page 6-71.) 5. Check the exposure lamp. It may have excessive stains or a section of filament may be bad. 6. Check the development unit. (Cross-mixing, DG).

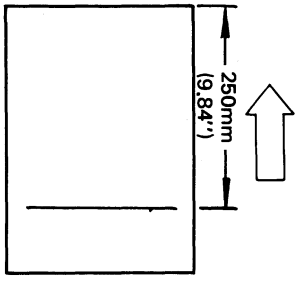
PHENOMENON	ACTION
Black stripe or band of heavy background. 	1. Clean the toner shield glass and the quenching lamp filter. 2. Check for toner pile-up on top of the development unit. This may result from overtoning due to dirty ID sensor or ID sensor out of adjustment. Another possible cause is gaps in the brush seal. 3. Check and adjust the exposure adjusting plates. (See page 6-6.) 4. Take out the exposure lamp and check it for: – Discoloration – Deformation of the lamp filament In either case, replace the lamp. (See page 6-3.) 

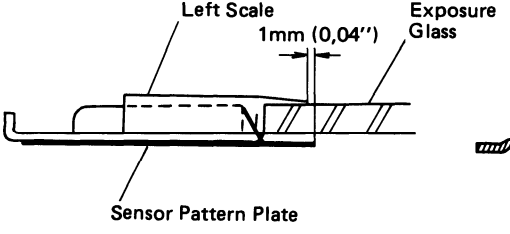
PHENOMENON	ACTION
Sharp vertical black lines. 	1. Check the drum for scratches. 2. If the drum is scratched, determine and correct the cause before installing a new drum. Possible causes: • Warped cleaning entrance mylar seal. • Something caught in the development unit seals. • T/S corona guide loose or deformed. 3. Check the interior of the fusing unit for damage. (Scratched rollers, damaged stripper pawls, etc.) **NOTE:** If the lines are wavy or cross each other, see “Wavy black lines or stripes.”

PHENOMENON	ACTION
Wavy black lines or stripes. 	Copy problems caused by the cleaning blade are often wavy. 1. Clean the cleaning unit; after that dust the cleaning brush and cleaning blade with setting powder. (See page 6-22.) 2. If the problem does not clear up, replace the cleaning blade (and brush). **NOTE:** If the cleaning blade edge is damaged, try to determine and correct the cause. Possible causes are: • Carrier on the drum. • Small projections on the drum surface. • Improper cleaning of the blade (Do not use cloth.) • Installing a new blade and/or drum without first dusting them with setting powder.

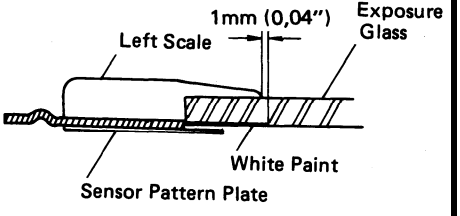
PHENOMENON	ACTION
Vertical white lines. 	1. Clean the charge corona wire; first with the wire cleaner, and if that does not work, with alcohol. 2. Check the charge corona unit for hanging thread or fiber that may discharge the drum. 3. Clean the development unit seals.

PHENOMENON	ACTION
Black lines 251 mm (9.88") apart  	1. Check the drum. It must be either scratched or have a line of toner stuck on it. 2. Replace the drum if it is scratched. **NOTE:** Drum scratches often occur when the slide unit is reset without the drum stay in position. The Mylar strip on the corona unit strikes the drum. 3. Clean the drum if it has toner lines on it. (Use clean soft cloth and alcohol.) 4. Check the cleaning blade release mechanism.

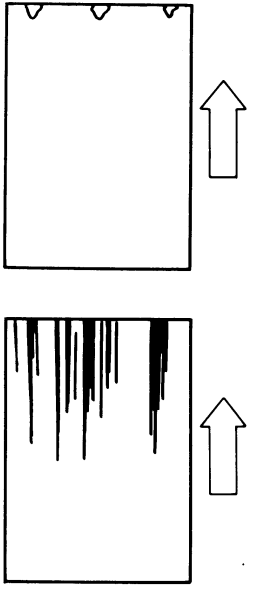
PHENOMENON	ACTION
Black line about 250 mm (9.84") from the leading edge. 	1. Clean the cleaning unit. Dust the cleaning blade and brush. with setting powder. 2. Replace the cleaning blade and cleaning brush if they are too worn. (See page 6-22.) 3. Check the positions of the original scale [FT3020] and the exposure glass [FT3050/FT3060].

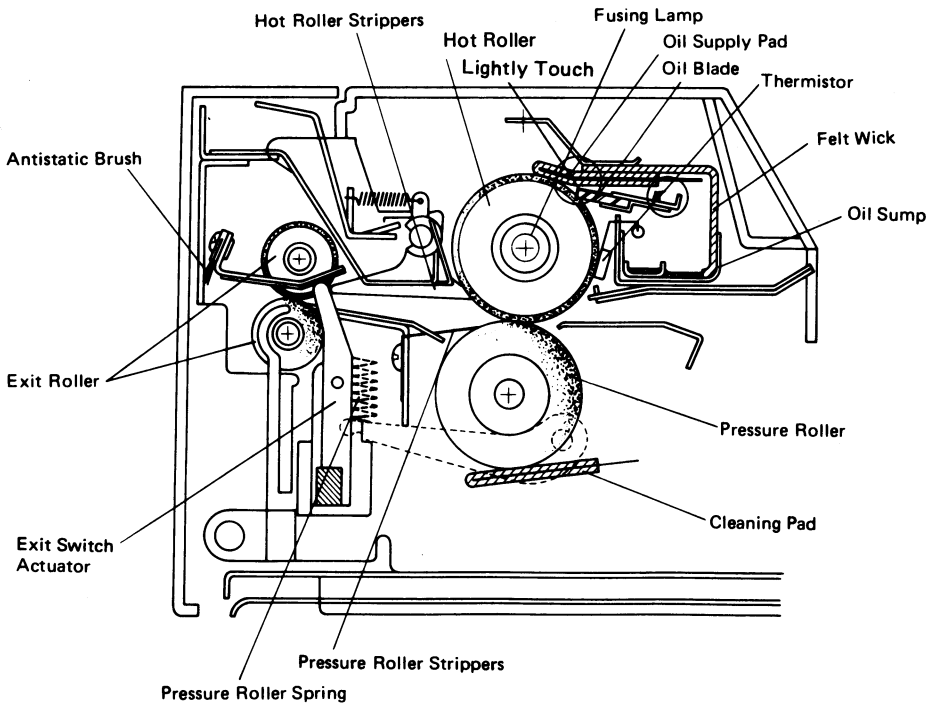


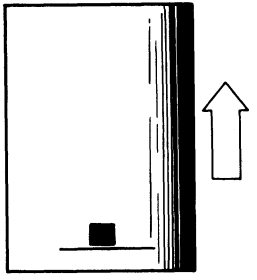
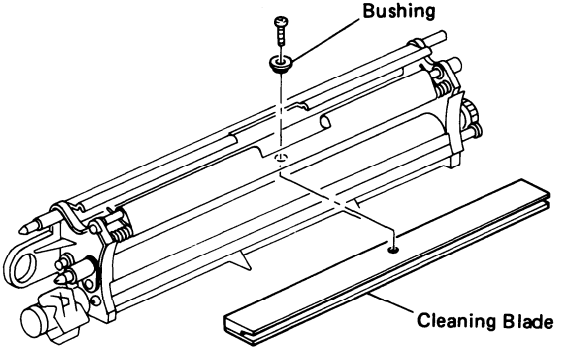
[FT3020]

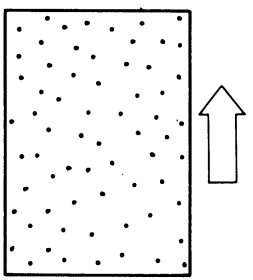


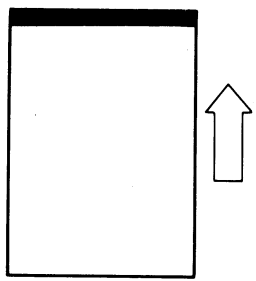
[FT3050/FT3060]

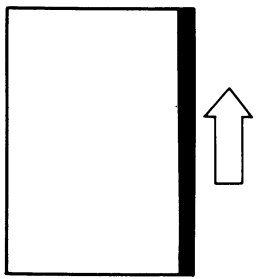
PHENOMENON	ACTION
Oil marks at stripper pawl positions. 	A small amount of oil marking, especially on the first copy, cannot be helped. But do the following if excessive. 1. Clean or replace the hot roller strippers. (See page 6-53.) 2. Check that the contact edges (ends) of the pressure roller strippers are smooth and clean. Also, make sure that the pressure strippers are all aligned and contact the pressure roller lightly. 3. Replace the hot and pressure rollers if they have been damaged. (See pages 6-52 and 6-53.) 4. Check the oil blade position. The edge of the blade should touch the surface of the hot roller. 5. Make sure the oil blade is not warped or wavy. Adjust the blade position or replace the blade. (See page 6-47.) 6. Check the 3 screws that secure the oil blade. They must be short (M4 x 6). 7. Make sure that the oil supply pad lightly touches the upper edge of the oil blade.

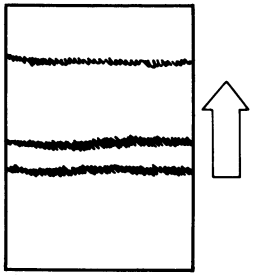
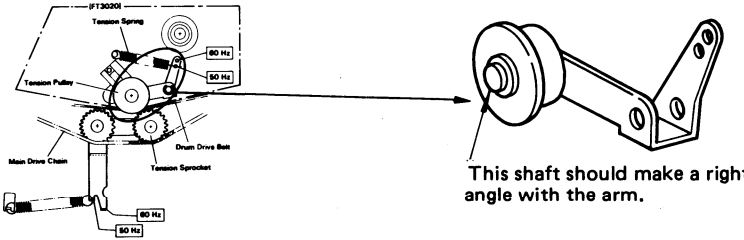
PHENOMENON	ACTION
Oil marks at stripper pawl positions.	8. If the above steps fail, replace and carefully position the oil supply pad and oil blade. (See pages 6-48 and 6-49.) 9. Replace the cleaning pad if it is too oily. (See page 6-47.) 

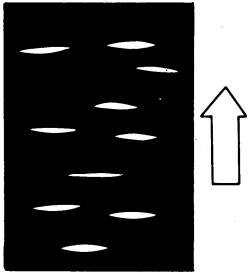
PHENOMENON	ACTION
Poor cleaning on one side or the other. Sensor pattern appears on white copies. 	1. Check the fit of the cleaning blade bushing and cleaning blade holder.  If they are not fitted together properly, the cleaning blade will not swivel and therefore will not set correctly against the drum when pressure is applied.

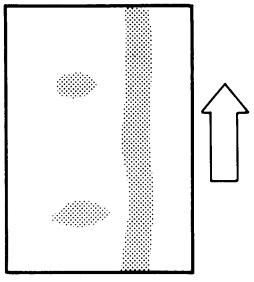
PHENOMENON	ACTION
The entire copy is covered with spots. 	1. Set the charge corona unit correctly. This problem occurs when the spring in the endblock is not making good contact with the high voltage terminal. The image appears “sandy” or “speckled.”

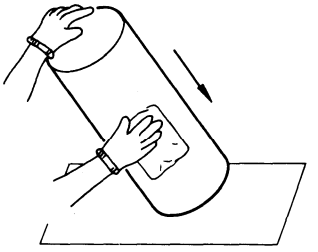
PHENOMENON	ACTION
Leading edge dirty background when copying colored originals and ID position is 5, 6, or 7. 	Adjust the position of the scanner home position sensor. (Move it to the right as viewed from the rear. See page 6-63 or 6-66-a.) **CAUTION:** Make sure that the scanner does not rebound when it returns to the home position.

PHENOMENON	ACTION
Black stripe on the rear edge of the copy. 	1. Make sure the toner shield glass is correctly set and conpletely seated.

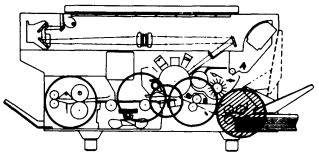
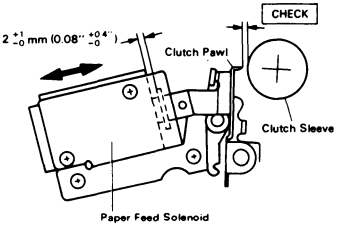
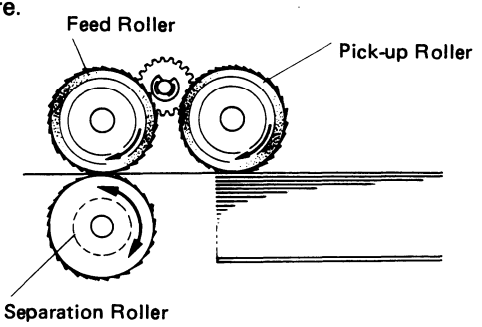
PHENOMENON	ACTION
Jitter 	1. Adjust scanner drive belt tension. [FT3020] 2. Adjust drum drive belt tension. [FT3050/FT3060] 3. Adjust the development drive belt tension. 4. Check the wire pulleys for wobble. 5. Make sure the scanner drive wire moves smoothly. 6. Clean the development unit gears. (Scattered toner cloggs gears.) 7. Clean the scanner brake pad and pulley. Make sure the brake friction is not excessive. [FT3020] 8. Check whether the timing belt teeth correctly align with and engage with the grooves of the timing belt tightener. (This will cause random jitter.)  • If not, reform the timing belt tightener. • If that does not work, replace the timing belt tightener. 9. Check the screws on the optics frame (those holding the Inlet cooling fan, Exhaust fan, etc.) Make sure that no long screws are used. (See page 6-10-a.) [FT3050/FT3060]

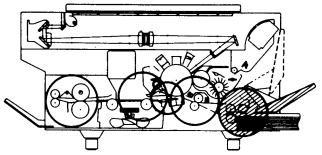
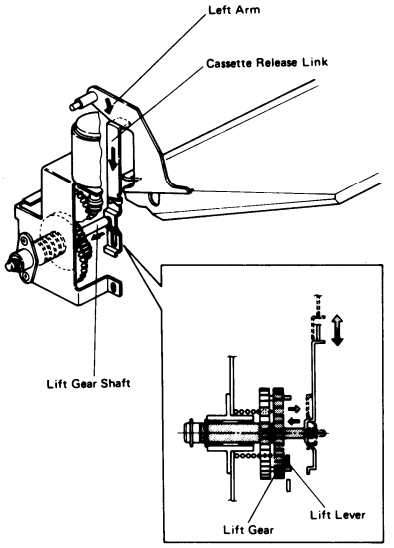
PHENOMENON	ACTION
Light spots in solids (Usually elongate horizontally). 	1. Clean the transfer and separation corona wires with alcohol and a clean cloth. 2. If the problem persists, replace the wires. **NOTE:** This problem may be caused by paper dust or clay on the wires.

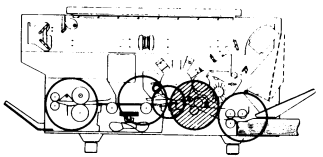
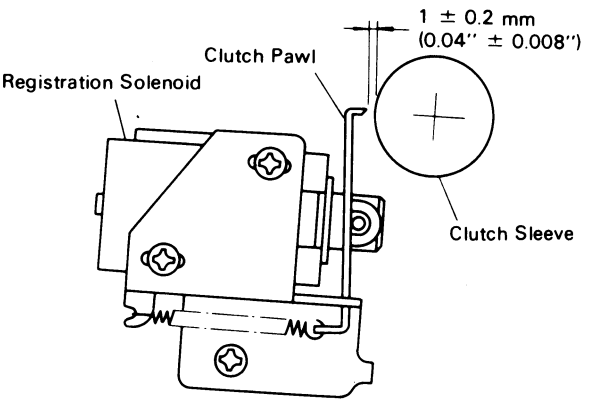
PHENOMENON	ACTION
Blurred or fuzzy image in the center of copies.  (Position) The → The (Image)	Clean the drum with RICOH DRUM CLEANING POWER as follows. **Materials needed:** 1. Ricoh Drum Cleaning Powder (Part No. 5447 9605). 2. Isopropyl Alcohol. 3. Cotton Pads. 4. Plastic Bag for Waste Cotton. 5. Plastic or Rubber Gloves. 6. Drum Setting Powder (Part No. 5442 9101). **CAUTIONS:** 1. Clean the drum in a well ventilated place. 2. Do not clean near open flame. (Alcohol is flamable). 3. Be sure to wear gloves. Never clean a drum with your bare hands. **Cleaning Procedure:** 1. Take the drum out of the copier and set it on a large sheet of paper. 2. Wipe all toner off of the drum with a dry cotton pad. 3. Dampen a clean pad with alcohol, and apply a small amount of cleaning powder to it.

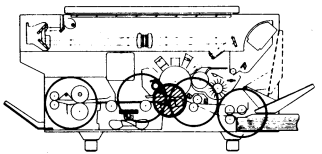
PHENOMENON	ACTION
Blurred or fuzzy image in the center of copies.	4. Mix the powder and alcohol until they form a thin paste. 5. Gently clean the drum stroking it smoothly from one end to the other, turning the drum slightly at the end of each stroke. **CAUTION:** (1) Do not rub the drum back and forth nor in a circular motion. (2) Be careful not to scratch the drum with fingernails or jewelry.  6. Repeat step 5 until the entire surface of the drum has been covered at least 10 times. Change the cotton pad, repeating steps 3 and 4 whenever the pad gets dirty. 7. Let the drum dry. Then, wipe all cleaning powder off of the drum using clean cotton pads. 8. Wipe the drum down using a cotton pad soaked with alcohol. Continue until the cotton no longer picks up any cleaning powder from the drum. 9. Let the drum dry and then dust it with setting powder.

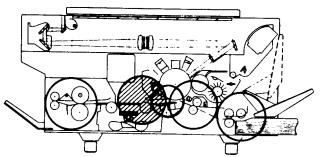
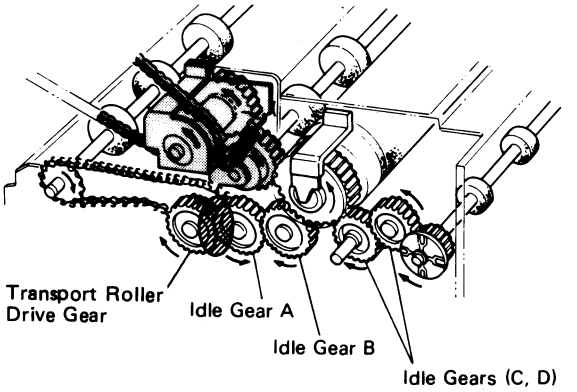
PHENOMENON	ACTION
Blurred or fuzzy image in the center of copies.	10. Reinstall the drum and make 10 B4 copies. (To pick-up any excess cleaning powder). Then, operate the copier in free run mode for 2 or 3 minutes. (To help the drum recover its photoconductive characteristics). 11. Make test copies. If the problem persists, repeat the drum cleaning procedure. 12. Seal the used cotton pads in a plastic bag and bring it back to the service center for disposal. **NOTE:** If the drum does not respond to cleaning, it has probably crystallized or is simply worn out. In such case, replace the drum.

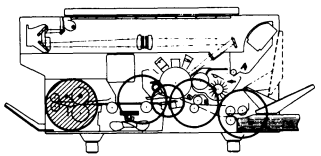
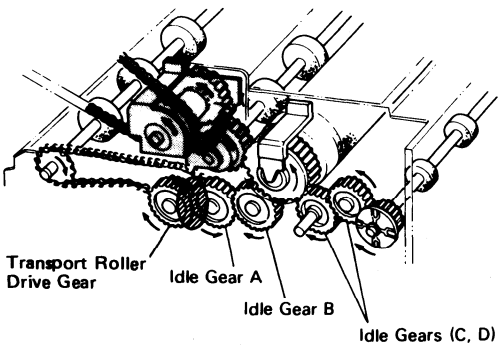
PHENOMENON	ACTION
Paper feed jam 	1. Clean the pick-up, separation, and feed rollers. 2. Clean and grease the slip clutch. 3. Check the operation of the feed clutch, feed solenoid, and feed clutch pawl. Adjust and grease as necessary.  4. Check the clearance between the pick-up roller and paper. Adjust the paper lift detector as necessary. 5. Make sure the surface tread of pick-up, feed, and separation rollers is oriented as shown in the following figure.  6. Replace the feed, separation, and pick-up rollers if they are worn.

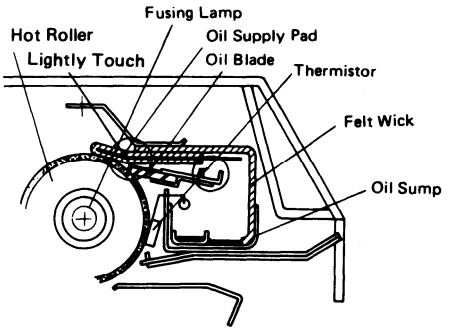
PHENOMENON	ACTION
By-pass feed jam 	Generally, jams occur in by-pass mode only when the cassette release mechanism is faulty. 1. Check and adjust the operation of the cassette release link. 2. Check and adjust the cassette lift mechanism. (The mechanism might be locked up.)  3. Check the FRR rollers. See step 5 of “Paper Feed Jam.”

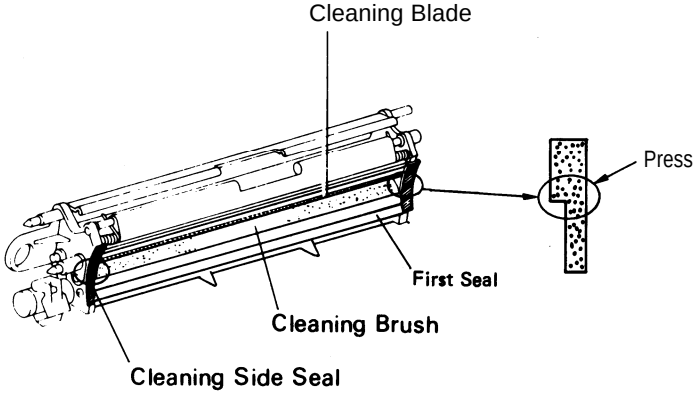
PHENOMENON	ACTION
Registration jam 	1. Check the release and detent action of the registration clutch pawl. Adjust as necessary.  2. Clean and grease the registration clutch.

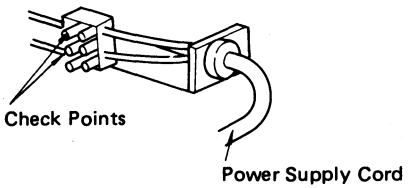
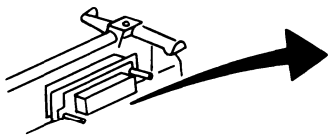
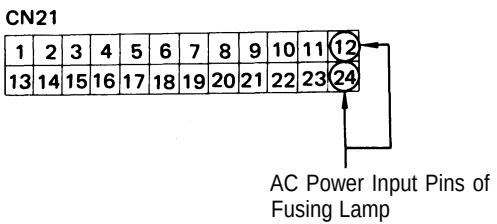
PHENOMENON	ACTION
Pick-off jam 	1. Clean the separation corona wire and set the T/S corona unit correctly. 2. Adjust the transfer/separation corona currents. • Transfer Corona ; DC + 14.6 $^{+0.06}_{-0.47}$ µA • Separation Corona ; AC 25.1 ± 1.5 µA DC -0.6 $^{+0.25}_{-0.6}$ µA 3. Check pick-off pawl operation. 4. Check the surface condition of the pick-off pawls. Replace if necessary. 5. Check the condition of the paper the customer is using. • Make sure the paper has no curl and is dry. • Advise the customer to use a type of paper that has the fiber oriented lengthwise. (This will help to reduce the number of jams due to paper curl.)

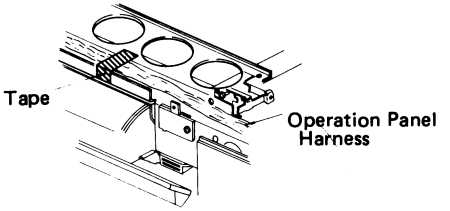
PHENOMENON	ACTION
Transport jam 	1. Check the engagement of the transport roller drive gear. 2. Confirm that the vacuum fan turns. 

PHENOMENON	ACTION
Fusing jam 	1. Check the oil bottle and oil pump operation. Make sure the pump works properly and that the oil tube extends to the bottom of the bottle. 2. Open the exit assembly and turn the fusing knob. Check whether oil is applied evenly to the hot roller. 3. If oil is not applied to the hot roller, check whether the oil supply pad and felt wick are wet with oil. 4. If they are not wet, make sure that: (1) The machine is level. (2) The wick touches the bottom of the sump. (3) Nothing is blocking oil flow in the sump. (4) The transport roller drive gear and idle gear A are correctly engaged. (See figure.) 

PHENOMENON	ACTION
Fusing jam	5. If the oil pad is wet, make sure that the oil blade is set correctly as shown below. 
Toner falling from the development unit. (Toner piled on the T/S corona endblock cover).	1. Change the toner supply control DIP switches to a lower percentage combination: For example: Detect Mode 30% —> 10% 2. Check the development unit seals. Replace them if they are worn or damaged.

PHENOMENON	ACTION
Toner falling from the cleaning unit.	1. Clean the cleaning unit. 2. Replace the first seal and/or side seals. **NOTES:** (1) When adhearing the first seal, make sure it is flat and not wavy. (2) When installing side seals, make sure they are aligned correctly. Press firmly at the points indicated in the figure. **CAUTION:** After doing above action do not forget to dust the cleaning blade, cleaning seal, and cleaning side seals with setting powder. 

PHENOMENON	ACTION
E3 comes on 130 seconds after the main switch is turned on.	1. Check the AC line when the machine is at full power. 2. If AC power is 90% or less of the correct value, you must find a way to increase AC power.  • Move the machine to a location that has sufficient power. • Remove other machines from the outlet that the copier is using. 3. Check pins 12 and 24 of the slide unit connector (CN21). Repair or replace the connector if it is faulty.   4. Check the fusing lamp input. 5. Check the resistance of the fusing lamp. 6. If the lamp terminals are blackened, clean them with fine sandpaper. 7. Refer to service call conditions (page 7-15) of the Field Manual.

PHENOMENON	ACTION
Abnormal operation panel display followed by abnormal machine operation.	This may be caused by a short in the operation panel harness. 1. Cover the exposed part of the harness with electrical tape. Replace the harness if it is badly damaged. 2. Tape the harness to the machine in such a way that it cannot be damaged when the top cover is installed.  3. If the problem continues, check the operation panel PCB and the main PCB. They may have been damaged by the short.

SECTION 11

FT3020/FT3050/FT3060

ELECTRICAL DATA

11. FT3020/FT3050/FT3060 ELECTRICAL DATA

11A. FT3020/FT3050/FT3060 Connector List 11-1

11B. FT3020 Component, Connector Layout 11-9

11C. FT3020 Point to Point 11-10

11D. FT3020/FT3050/FT3060 Schematic Main Board 11-11

11E. FT3050/FT3060 Component Layout 11-12

11F. FT3050/FT3060 Connector Layout 11-13

11G. FT3050/FT3060 Point to Point 11-15

11H. Schematic Optics Board 11-16

11I. Timing Chart 11-17

11A. FT3020/FT3050/FT3060 Connector List

O ... Used
x ... Not used

AC Harnesses

CN NO.	Description	115V			220/240V		
		3020	3050	3060	3020	3050	3060
CN 1	Lamp Regulator (CN1)	O	O	O	O	O	O
2	Anticondensation SW	O	O	O	O	O	O
3	Outlet Cooling Fan Motor	O	O	O	O	O	O
4	Exhaust Fan Motor	O	O	O	O	O	O
5	Transformer (220, 240, 115V)	O	O	O	O	O	O
6	Transformer (10, 20, 29V)	O	x	x	O	x	x
	Transformer (10, 23, 29V)	x	O	O	x	O	O
7	Exposure Lamp	O	O	O	O	O	O
8	Anticondensation Heater	O	O	O	O	O	O
9	Main Motor	O	O	O	O	O	O
10	Main Board Interharness	O	x	x	O	x	x
11	Power Pack-Charge, Bias	O	O	O	O	O	O
12	AC Interharness 1	O	O	O	O	O	O
13	Inlet Cooling Fan Motor	O	O	O	O	O	O
14	Terminal	O	O	O	O	O	O
15	RA2 Harness	x	x	x	O	O	O
16	AC Interharness 2	x	O	O	x	O	O

O ... Used
x ... Not used

CN NO.	Description	115V			220/240V		
		3020	3050	3060	3020	3050	3060
17	AC Interharness 3	x	O	O	x	O	O
101	Main Board (10, 29 VAC)	O	O	O	O	O	O

Slide Unit Harnesses (AC and DC)

CN NO.	Description	115V			220/240V		
		3020	3050	3060	3020	3050	3060
CN 25	Fusing Control Unit	O	O	O	O	O	O
26	Fusing Unit-1	O	O	O	O	O	O
27	Fusing Unit-2	O	O	O	O	O	O
28	Thermistor	O	O	O	O	O	O
29	Power Pack-Transfer, Separation	O	O	O	O	O	O
30	Vacuum Fan Motor	O	O	O	O	O	O
31	Exit SW	O	O	O	O	O	O
32	Toner Over Flow	O	O	O	O	O	O
33	Oil End Sensor	O	O	O	O	O	O

O ... Used
x ... Not used

DC Harnesses

CN NO.	Description	115V			220/240V		
		3020	3050	3060	3020	3050	3060
CN 20	DC Interharness	O	O	O	O	O	O
21	Slide Unit	O	O	O	O	O	O
22	Power Pack-Charge, Bias (DC)	O	O	O	O	O	O
23	Cleaning Solenoid	O	O	O	O	O	O
24	Relays	O	O	O	O	O	O
102	Main Board	O	O	O	O	O	O
103	Main Board	O	O	O	O	O	O
104	Main Board (to Operation Panel)	O	O	O	O	O	O
114	Operation Panel Board	O	O	O	O	O	O
107	Optics Board Interharness	x	O	O	x	O	O
109	Main Board (to Coin Lock)	O	O	O	O	O	O
50	Photosensor Interharness	O	O	O	O	O	O
51	Paper Feed Sensor	O	O	O	O	O	O
52	Image Density Sensor	O	O	O	O	O	O
60	Detector Interharness	O	O	O	O	O	O
61	Toner End SW	O	O	O	O	O	O
62	By-pass Detector	O	O	O	O	O	O
63	Lift Detector	O	O	O	O	O	O
64	Paper End Detector	O	O	O	O	O	O

O ... Used
x ... Not used

CN NO.	Description	115V			220/240V		
		3020	3050	3060	3020	3050	3060
70	Registration Solenoid	O	O	O	O	O	O
71	Paper Feed Sensor	O	O	O	O	O	O
72	Add Toner Solenoid	O	O	O	O	O	O
73	Pulse Generator	O	O	O	O	O	O
74	Erase Lamps	O	O	O	O	O	O
75	Quenching Lamps	O	O	O	O	O	O
76	Registration SW	O	O	x	O	O	x
77	Magnetic Clutches	O	x	x	O	x	x
78	Home Position SW	O	O	O	O	O	O
79	Key Counter	O	O	O	O	O	O
80	Pick-off Solenoid	O	O	O	O	O	O
81	Total Counter	O	O	O	O	O	O
82	Lamp Regulator (CN2)	O	O	O	O	O	O
83	Lift Motor	O	O	O	O	O	O
84	Jam Keep Solenoid	O	O	O	O	O	O
85	Paper Size Detection Board	O	O	O	O	O	O
90	Overun SW	x	O	x	x	O	x
91	Rear Cover Safety	O	O	O	x	x	x

O ... Used
x ... Not used

CN NO.	Description	115V			220/240V		
		3020	3050	3060	3020	3050	3060
92	Lens Drive Motor	x	O	O	x	O	O
93	Overun SW (Enlarge)	x	O	x	x	O	x
94	Not Used	x	O	O	x	O	O
95	Paper Size Detection (By-pass)	x	O	O	x	O	O
96	Lens Home Position SW	x	O	O	x	O	O

Optics Board Harnesses

CN NO.	Description	115V			220/240V		
		3020	3050	3060	3020	3050	3060
CN201	Main bead Interharness	x	O	O	x	O	O
202	DC Interharness	x	O	O	x	O	O
203	AC Interharness	x	O	O	x	O	O
204	Scanner Drive Motor	x	O	O	x	O	O

O ... Used
x ... Not used

Tn	Color Code	Description		115V			220/240V		
				3020	3050	3060	3020	3050	3060
1	R	Hot							
2	C	Neutral							
3	R	Anticondensation Heater	Main SW	O	O	O	O	O	O
4	C								
5	R	Hot							
6	C	Neutral							
7	R	Fuse 8A		x	x	x	O	O	O
		Circuit Breaker		O	O	O	x	x	x
9	R								
8	C(R)	Fuse 3A		O	(O)	(O)	O	(O)	(O)
10	C(R)								
11	R	RA2-1 (AC)		O	O	O	O	O	O
12	Z								
13	B	RA2-2 (AC)		O	O	O	O	O	O
14	B								
15	R	RA1 (AC)		O	O	O	O	O	O
16	R								
17	C								
18	C								

O ... Used
x ... Not used

Tn	Color Code	Description	115V			220/240V		
			3020	3050	3060	3020	3050	3060
20 21 22 23	R R C C	Noise Filter	O	x	x	O	O	O
24 25 26 27	R C R C	Safety SW	x	x	x	O	O	O
28 29	Z Z	Main Motor Capacitor	x	O	O	O	O	O
30 31	Z Z	Front Door SW	O	O	O	O	O	O
32 33	Y T	Jam Reset SW	O	O	O	O	O	O
34 35	Z Z	Rear Cover Safety	O	O	O	x	x	x
36 37	Y T	RA1 (DC)	O	O	O	O	O	O

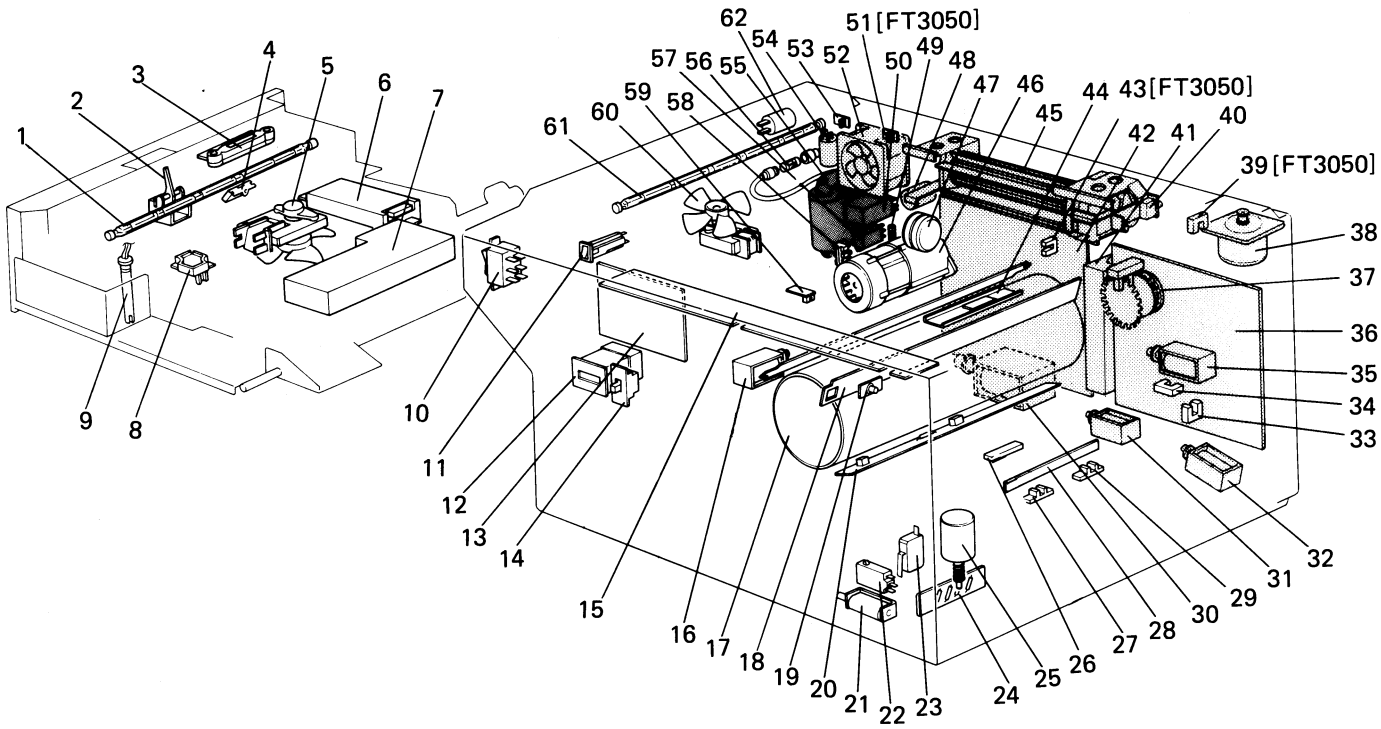
O ... Used
x ... Not used

Tn	Color Code	Description	115V			220/240V		
			3020	3050	3060	3020	3050	3060
38 39	Y Z	RA2 (DC)	O	O	O	O	O	O
40 41	W C	Fusing Lamp	O	O	O	O	O	O
42 43	W W	Thermofuse 169 C	O	O	O	O	O	O
44 45	R C	Surge Suppression Capacitor	x	x	x	O	x	x
46 47	R Z	Fusing Control Unit	O	O	O	O	O	O

Wire Color Code Table

Code	Color	Code	Color
R	Red	P	Pink
C	Blue	H	Gray
Z	Orange	T	Brown
Y	Yellow	M	Purple
W	White	S	Sky Blue
B	Black		

Electrical Component Layout



PCB'S

13 Lamp Regulator Board
15 Operation Panel Board
20 ID Sensor Board
24 Paper Size Detection Board
28 Paper Size Detection Board (By-pass Mode)
36 Optics Board
42 Main Board

MOTORS

5 Vacuum Fan
45 Inlet Cooling Fan
46 Main Motor
52 Exhaust Fan
60 Outlet Cooling Fan
25 Lift Motor (DC)
38 Scanner Drive Motor
47 Lens Drive Motor

SOLENOIDS

16 Pick-off Sol
21 Jam Keep Sol
30 Cleaning Sol
31 Registration Sol
32 Paper Feed Sol
35 Toner Supply Sol

SWITCHES AND DETECTORS

2 Exit SW
10 Main SW
14 Anticondensation SW
9 Oil End Sensor ([FT3050] for machine serial numbers over 6240322836.) ([FT3060] for all serial numbers.)
8 Toner Overflow Sensor ([FT3050] for machine serial numbers over 6240322836.) ([FT3060] for all serial numbers.)
19 Safety SW (220, 240V)
22 Jam Reset SW
23 Front Door SW
26 Paper Feed Sensor
27 Paper End Detectors
29 Lift Detector
33 By-pass SW
34 Toner End SW
39 Overrun SW [FT3050 only]
40 Rear Cover Safety SW (115V)
43 Overrun SW (Enlarge)
51 Registration Sensor [FT3050 only]
53 HP Sensor
59 Lens HP Sensor

OTHERS

1 Fusing Lamp
17 Quenching Lamps
18 Erase Lamps
61 Exposure Lamp
3 Thirmofuse 169°C
4 Thermistor (TH-1)
6 Fusing Control Unit
7 Power Pack – T, S
41 Power Pack – C, B
12 Total Counter
37 Pulse Generator
44 Anticondensation Heater
48 Motor Capacitor
49 Fuse 8A (220, 240V)
11 Circuit Breaker (115V)
56 Fuse 3A
50 RA1
57 RA2
54 Noise Filter (220, 240V)
55 Transformer
58 Terminal
62 Surge Suppression Capacitor (220, 240V)